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FOOD INDUSTRIES

PRODUCTION . ENGINEERING . DISTRIBUTION

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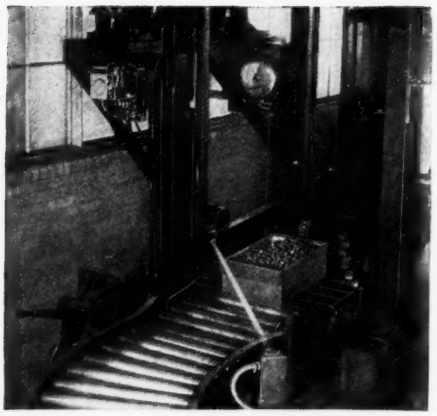

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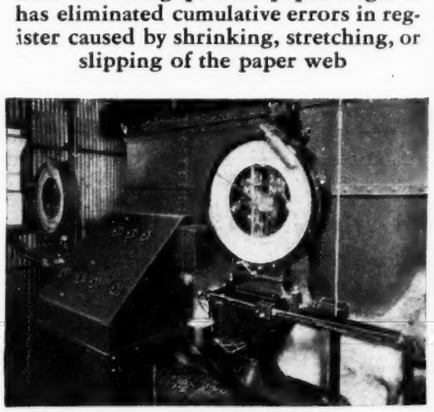
Here's an "electric eye" maintaining register in cutting printed paper bags. It has eliminated cumulative errors in register caused by shrinking, stretching, or slipping of the paper web



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FOOD INDUSTRIES

Volume 5 Established 1928—McGraw-Hill Publishing Company, Inc. Number 11

PRODUCTION • ENGINEERING • DISTRIBUTION

NEW YORK, NOVEMBER, 1933

•

Laurence V. Burton, Editor

Food Law Revision Forgotten Amid Economic Clamor

● A most radical overhauling of the Federal Food and Drug Law is still before Congress. The food industries seem to have forgotten about it. But they must awaken to the urgency of a careful study of the proposal.

● Parallel column comparisons of the existing law and the proposed legislation are presented elsewhere in this issue. Also are appended comments showing that the bill establishes regulatory provisions which should not be lightly considered.

● Every trade association and every industrial executive should give careful study to the bill. Each should interpret the new legislation in terms of its significance to his own enterprise. All parts of the bill which apply to food manufacture were published in July, 1933, FOOD INDUSTRIES.

● When the new law is enacted, industry will have to live under it for many years to come—the present law has been in force for more than a quarter of a century. The importance of pending drastic legislation which has such a great expectancy of life overshadows even the pressing problems of N.R.A. codes, A.A.A. marketing agreements, or dealer licensing plans. Important though the latter emergency measures may be, amendments and changes in them will easily be made, but we cannot expect similarly easy correction of a new Food and Drug Law, once it is on the statute books.

● FOOD INDUSTRIES looks with favor on the idea of proper supervision of advertising. We believe that public interest now requires a federal supervision of cosmetics in the manner provided for foods and drugs. We join the Department of Agriculture in commending a sane legislative effort in these directions, but we do not agree with some of the other drastic and novel provisions found in the bill as introduced last spring at the request of the department.

● In particular a warning is voiced against the revealing thought frankly expressed by Assistant Secretary of Agriculture Rexford G. Tugwell, sponsor of the bill. He says that the law should be drawn so broadly that, no matter what the offense which may later develop, the culprit may be easily apprehended and convicted. While we are not apprehensive of the executive interpretation by an understanding and fair-minded Secretary of Agriculture such as we believe Henry A. Wallace to be, we do not experience a feeling of equal confidence in contemplating some of his subordinates in that relationship. The likelihood of discretion, fairness and conservativeness in the enforcement of the proposed law by those who would remake human society on their own plan seems rather indefinite. It would be a mistake to encourage them to drastic exercise of power by enacting a law so broad as that which is proposed.

● Another statement by Assistant Secretary Tugwell gives us pause: He said that the enforcement of the new law "will seldom fall on others than those who merit its penalties." Apparently there is more in the proposed law than meets the eye. FOOD INDUSTRIES does not believe that any law should be adopted that gives so clear an implication of occasional injustice as Assistant Secretary Tugwell here admits.

● As soon as hearings on the bill are started before congressional committees, manufacturers and food trade associations should make appearance with recommendations for the changes they desire. The time to prepare for these appearances is now.

AS IT LOOKS TO US

Keep Label Inventories Low

Under the provisions of the proposed food law, many labels will need to be materially revised. Wise management will keep label inventories, and also promotional literature, down to minimum requirements for about six months ahead until it is definitely known what form the law will take.

If the coming session of Congress follows the President's lead with anything like the alacrity of the past special session, then we can expect the law to be most drastic. Many a food specialty manufacturer will hardly recognize his own labels if they must conform to the present proposals.

The Place to Start . . .

If higher education has not deprived younger men of their intestinal fortitude there is a place for them in food manufacture. But the starting point is one that is seldom to the liking of a man who has been educated to think he has a good job awaiting him.

One place where there are jobs available frequently is driving a bread wagon. Unfortunately, college graduates seldom make good on this work, because they feel quite superior socially to the trade they serve.

Another place where the educated man seldom dreams of starting, yet it is the right place to begin, is driving a milk wagon.

In these humbler positions persistence and fortitude count for more than education, but the apprenticeship for better things need not be overlong.

Modernize and Mechanize

Considerable changes in many forms of manufacturing operations are more than a possibility in the near future if the revolutionary laws of the "New Deal" succeed at all in their purpose. High-cost plants will be *forced* to become medium-cost or low-cost plants. This means greater mechanization, and when we say this, we are fully cognizant of the purposes of the N.I.R.A. We, ourselves, have heard word from General Johnson's own lips to the effect that inefficient plants shall not be allowed to pay low wages merely for the sake of continuing their existence.

Be Our Guest . . .

Now is the time to plan your days to permit a visit to the Chemical Engineering Exposition at Grand Central Palace in New York on Dec. 4 to 9. Whether a plant manufactures foods or the products of chemical engineering, the equipment and methods used are almost identical. Food engineering is only chemical engineering plus sanitary control.

Here you will find the best ideas and equipment for processing foods or chemicals which have been developed in the past two years. Plan to spend at least a half day or more at the exposition. Free tickets are obtainable by writing to the editor of FOOD INDUSTRIES.

Reasoning Without Facts

Our neighbor, the Philadelphia *Record,* takes a wicked crack at certain food manufacturing concerns, pointing out that in a year of "the darkest hours of the farmer's history" these concerns are able to pay larger dividends in the period 1930-32 than in 1927-29. "Lower prices," says the *Record,* "would have stimulated consumption and increased the market for the farmer's product."

FOOD INDUSTRIES questions the accuracy of the conclusion. We believe that lower prices might have decreased the market for the farmer's output, because most of the products of two of the victims of its displeasure manufacture relatively little raw material of a nature such as would benefit the farmer.

Our reasons are that:

Yeast is grown largely on Cuban molasses.

Coffee comes from other countries.

Baking powder is hardly an agricultural product.

Chocolate is a product of the tropics.

Salt is a mineral.

Tapioca comes from Java.

Coconut from the Philippines.

Pectin from apple peelings, otherwise wasted.

Gelatin from calfskin trimmings, otherwise wasted.

Oysters are still grown in the sea.

This leaves prepared cereals, and a moderate sized business in wheat flour, meats and pickles, and a very small volume of canned foods to be attributed to the domestic farmer, and it is shared by two large companies.

To our way of thinking, it is most unsafe to assume that, because a manufacturer is successful, his success is at the expense of the farmer.

Where They Come From

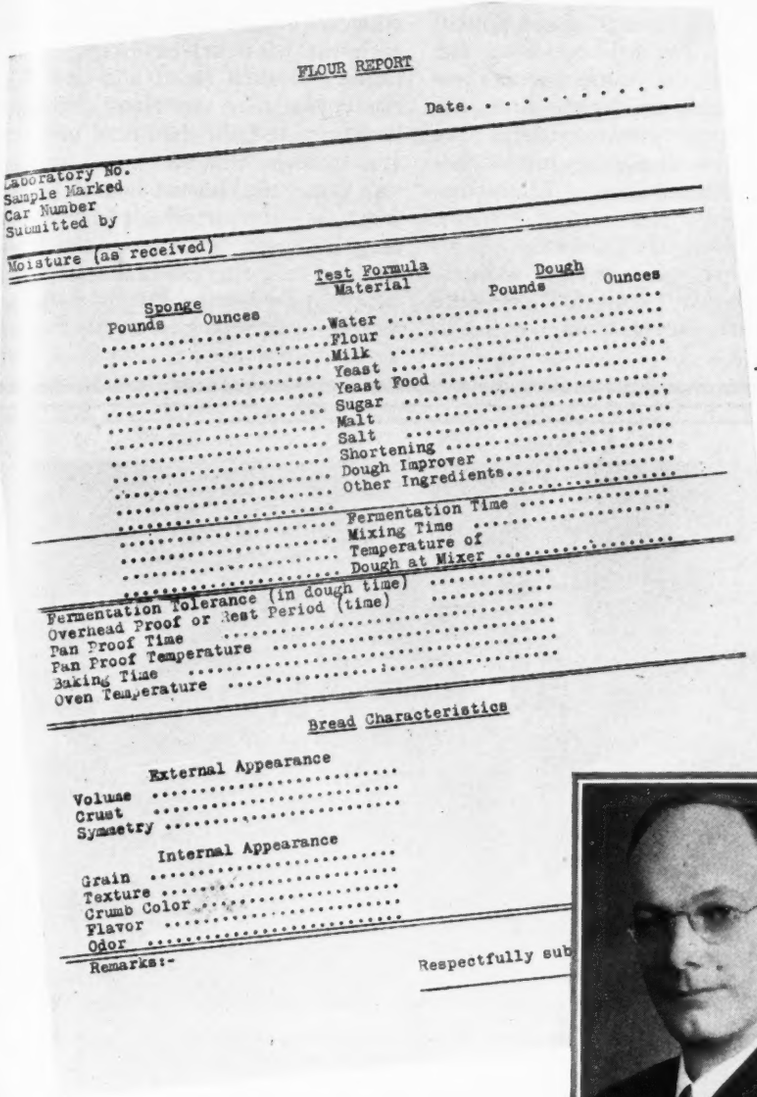
The outstanding impression one gained at the Brewery Exposition in October was that most of the new things were products of industries which had never sold to brewers before. A flood of new equipment and ideas comes from outside, and pitifully few from within an industry—regardless of its nature.

Like Arguments? . . .

Figure out this one. A gentleman of our acquaintance once owned a nice business in an Eastern city. The plant was small, but up to the standards of the day. He made money and, idealistically, shared it with his employees. Everybody got a raise every six months—regardless. The going was fine until 1929. After that he began to lose money, but still everybody got his semi-annual raise. The owner was very socially minded. The business was "run for the employees" (his own words).

Next he was forced to sell out or close up. There wasn't any more money. The new owner fired two-thirds of the help, cut the remaining wages in half, retained the former owner on a salary that was diminutive, if appearances count for anything. The place is still doing business in a modest way at the old stand.

The argument? Well, what real good did the employees gain? Did they get anything but expensive tastes?



FLOUR REPORT

Date. . . . . .

Laboratory No.
Sample Marked
Car Number
Submitted by

Moisture (as received)

Test Formula Material	Dough Pounds	Dough Ounces
Water		
Flour		
Milk		
Yeast		
Yeast Food		
Sugar		
Malt		
Salt		
Shortening		
Dough Improver		
Other Ingredients		

Sponge Pounds . . . . . Sponge Ounces . . . . .

Fermentation Time
Mixing Time
Temperature of Dough at Mixer

Fermentation Tolerance (in dough time)
Overhead Proof or Rest Period (time)
Pan Proof Time
Pan Proof Temperature
Baking Time
Oven Temperature

Bread Characteristics

External Appearance
Volume
Crust
Symmetry

Internal Appearance
Grain
Texture
Crumb Color
Flavor
Odor

Remarks:-

Respectfully sub

Taking the *Mystery* Out of a NEW CAR OF Flour

By **ROWLAND J. CLARK**
Kansas City, Mo.

STARTING a new car of flour causes an uneasiness in the mind of the bread production superintendent which may or may not be openly expressed. From past experience he knows that each car holds a mystery whose solution may require the work of one night or of a week of nights.

Some of the worrisome queries which pass through his head are: "What absorption will the new car require?" "Will the doughs be 'bucky'?" "How will the sponges come?" "Should the box proof be 'caught' young or old?" "Will the dough stand steam in the oven?"

True, there are other ingredients used in making bread. But the salt, sugar, yeast, milk, water and other materials do not seem to vary as much as the flour. Even the steps of manufacture through which the bread passes in going from the material storage room to the delivery truck seem to get out of adjustment much less than does the flour.

If the superintendent is working in a small shop where a car of flour will last a month, it is quite likely that he will be able some time before the car is consumed to adjust his baking conditions so that the bread is produced under conditions that bring out the flour's best baking qualities. If he has charge of a large shop in which several cars of flour are consumed each week, he may never find the combination of baking conditions necessary to produce his type of bread before the flour is used up. To be sure, the bread is salable and the public may not notice a variation in its quality; but the production superintendent detects a variation, and it worries him.

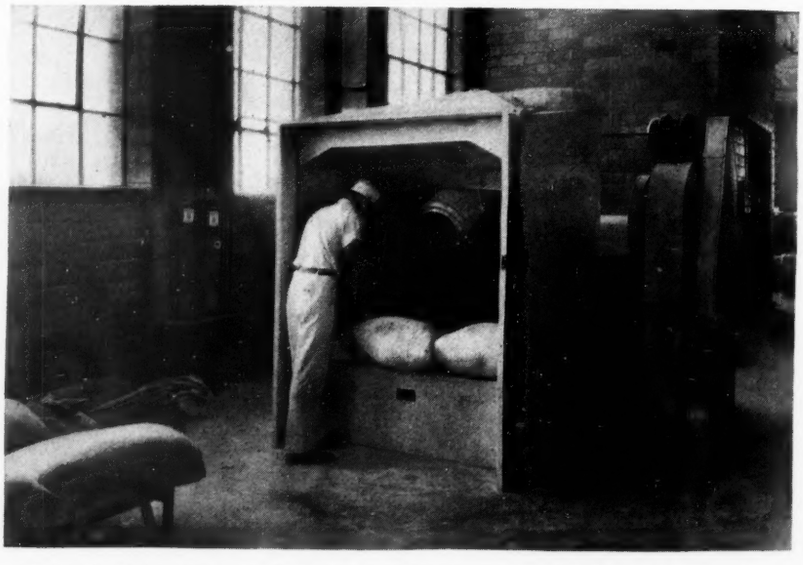
Many methods are used to overcome this lack of uniformity in the bread when changing from one car of flour to another. In some shops where only one flour is used at a time, it is the practice to run "trial" doughs on a new car for a week before the car is placed in full production. By this method one full-sized experimental dough is run each night along with the regular doughs, using the flour from the new car and varying the different baking factors to discover the best way in which to handle the new flour before it must be used for the entire production. In this way, a knowledge of the new flour's requirements is gained without endangering a whole night's run or ruining any of the bread.

In other shops, the blending of two or more flours is done in such a way that no two flours are changed on the same night's run. By this plan only one new car of flour is introduced into the blend at a time, and that is done in such a way that, if the new flour is not exactly like its predecessor in fermentation requirements, the other older flours are supposed to cover up the defects produced until adjustments can be made. The advantage in this method of blending two or more flours together is that, if one flour is of inferior quality, it does not influence the bread as largely as it would if the flour were used alone. The disadvantage is found in trying to find two or more flours whose baking characteristics are near enough alike to make them suitable for blending. Flours of unlike baking characteristics cannot be blended successfully.

Still another method of introducing a new car of flour into full production in a shop is to start using the new flour in the amount of about 10 per cent with 90 per cent of the old car or in a 90 per cent blend of other flours. Each night the quantity of the new flour is increased, the baking factors are adjusted to keep pace with the requirements of the flour blend, and the quantity of the old flour used is tapered off until finally the quantity of new flour reaches the desired percentage in the blend. As the baking adjustments have kept pace with the flour increases, no sudden changes are experienced. The advantage of this plan is the apparent smoothness of production operations while the new flour is being introduced. The disadvantage lies in the difficulty of finding flours which blend advantageously in all proportions.

These are only a few of the practices for placing a new flour or a new car of the same flour in bakeshop production. All of them are merely schemes which the superintendent has devised to protect his bread quality and to keep it as uniform as possible, thereby minimizing his worries.

In many cases the superintendent's worries of non-uniformity in his bread are justified, because they are due to causes entirely unknown to him and hidden from his perception until he starts baking. Flour is a bread material that is full of activity in the form of enzymes, which are capable of altering its baking characteristics from day to day. For this reason in a small shop where one car a month is the limit of consumption, the end of a car will not work like the first of the same car. Four weeks of aging in storage alters the flour's baking characteristics. In such a case small adjustments of factors such as absorption and fermentation time have been made during the month to suit the demands of the flour. When the new flour is introduced, a return to the old procedure of a month previous may be necessary. If, on the other hand, these car changes occur at certain seasons of the year, even greater fermentation changes are required because of the "curing out" tendencies of the wheat from which the flour was ground.



Flour in designated quantities for a mix are run through a sifter to make the blend as complete as possible

In the larger shop, where changes from one car of flour to another are more frequent, the aging influences do not have time to alter the baking factors before a car is consumed. Even in such shops, the baking procedure must be watched carefully to secure the best results. As modern competition demands that the bakery superintendent produce his bread at the peak of the flour's best baking ability for his type of a loaf, he is willing to change his methods of handling a flour, provided he knows that the changes he makes will not upset his shop or that he is changing in the right direction to produce better bread.

Fortunate is the superintendent who has a laboratory to run tests on each car of flour, catch the irregularities, if such exist, and point out the changes in the plant procedure necessary to hold the bread uniform. But to make this service of work-a-day value, the chemist himself should make the interpretation of his laboratory findings. Placing in the hands of a bakery superintendent a report which includes the flour's moisture, ash, protein, viscosity, H-ion concentration, acidity, diastatic power or any of the other chemical factors contributes very little or nothing to the successful regulation of bread doughs through the shop. Only one of such chemical data (that of moisture) can be put to practical use by the superintendent. And that is because the moisture content of a flour has a direct relation to the flour's absorption.

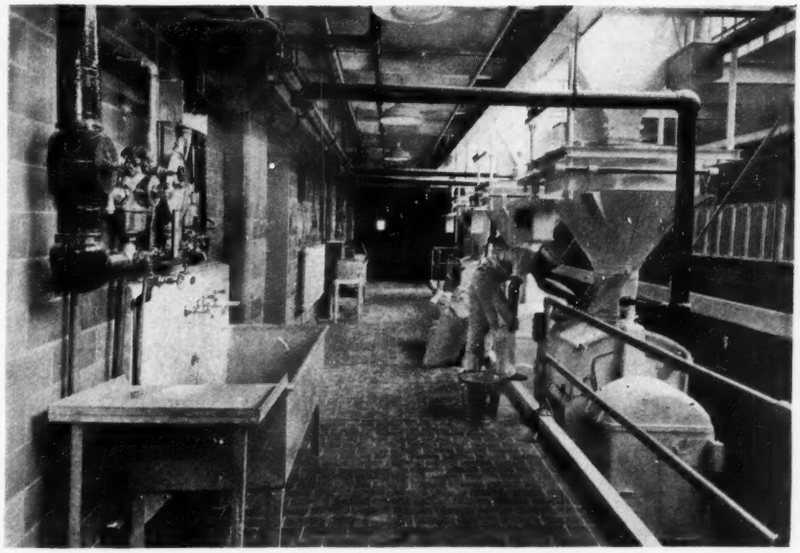
From the start the bakery laboratory should adopt for its testing work the same standard bread formula as that used in the bakeshop which it serves. This is advisable because flour, when used in different formulas, responds in as many different ways as there are formulas used.

On the basis of the plant formula, the laboratory can make small changes to see if improvements result. And it should keep the plant informed as to whether the plant is using the best combination of materials. Frequently, however, a for-

mula is worked out to bake a certain type of bread, and it must be borne in mind that if any radical changes are made (unless a change in materials justify them), the style of bread will be modified. Naturally, if sponge bread is being baked, the formula will state the quantity of flour to be used in the sponge. This is important, because crop conditions alter the quantity of sponge flour to be used for the best results. Sometimes a 50 per cent sponge produces the desired loaf. On other crops the same type of bread may require a 60 or even a 70 per cent sponge.

The fermentation time of the sponge and dough (or of the dough alone in case straight doughs are run) is important information to the plant superintendent, because it tells him whether or not his shop schedule will have to be changed. The mixing times for the sponge and dough warn the superintendent as to the amount of punishment the flour requires during mixing. If an indication of the total amount of mechanical punishment, such as mixing, dividing, rounding and molding, which the dough will stand can be given, the superintendent will be supplied a more accurate map for his guidance. The superintendent is interested also to know the sponge and dough temperatures of fermentation which prove successful. Some flours work best when the sponge temperature is held as low as 74 deg. F. and the time of fermentation increased. Other flours may require a short fermentation time with about 78 deg. F. for a sponge temperature.

Also, the superintendent is much interested to know whether the flour must be "handled with gloves," is "touchy," or if it has a wide fermentation tolerance (the period of time over which the flour will produce good bread). Some flours produce good bread with over an hour's difference in sponge time, while others must be taken within 15 minutes to do their best baking. The sponge time is not as important as the dough time in this respect. If a flour will produce good bread over a range of 30 minutes' difference in dough time, the superintendent has nothing about which to worry. If, on the other hand, the best baking range is only 10 minutes (and it takes 20 minutes to run the dough through the make-up machinery), part of the dough may be too young for the machines and part may be too old. Here the superintendent would be confronted with having a "spotted" production or with having to cut the size of his doughs, which might slow up his shop. Another alternative in such a case would be to have the flour rejected.



The blended flours are weighed into the mixers along with other ingredients to be made into a sponge or a dough, in which state they are mechanically and enzymically conditioned for a definite period of time.

The superintendent is anxious to know how his new flour is going to work right down to the time it comes as bread from the oven door. Many a fermentation process has been perfect down to the pan-proof time in the box, only to have the bread ruined while passing through this stage. Too long or too short a proof time can make or ruin a loaf. The common practice is to proof the dough to a certain height in the pan. At first, this height is guessed at by the superintendent, as the only way he has of telling when a rack of pans is ready for the oven is to touch lightly the dough with his fingers, thereby relying upon his judgment (born of experience) to mark the time when the doughs should go to the oven. After making a few tests by feeling the doughs, the time required in proof is noted and the oven man instructed to put the pans in the oven after a certain interval in box proof. Frequently, though, new cars of flour work through the manufacturing steps to this point just as previous cars; but for some reason the dough speeds up or slows down its fermenting action in the box.

If the proper baking factors are determined, the bakery laboratory furnishes the bakery superintendent very accurate information about the loaf characteristics (oven spring, color of crumb, loaf volume, grain and texture) which can be expected. The laboratory can also assure the superintendent a flour supply whose range of good bread production is amply large enough to prevent trouble.

Let the attention now be directed to a plant whose superintendent is furnished laboratory reports on each car of flour used. One certain brand of flour is being baked in this shop and it is stored three weeks in the plant before being consumed. As a sample is sent the bakery laboratory by the mill when the car is shipped, the laboratory can hold the sample for the same storage period as the plant has the flour in storage, bake it, and render a report before the plant starts to use the car.

Experience has pointed out that three baking factors will nearly always include most of the variables necessary to change in going from one car to another. They are: absorption, dough mixing time and dough fermenting time. The other factors after having once been fixed can usually be left constant. A flour whose tolerances in mechanical,

(Turn to page 444)

How *Spaghetti Sauce* Is Made

By DONALD S. HUBER
Cereal, Pa.

THE really important factor in the manufacture of canning spaghetti is the sauce—its quality and preparation. The canner must recognize and appreciate the commercial value attached to the quality of the sauce. The flavor of canned spaghetti is due largely to the sauce, and as flavor is the dominating factor in the success or failure of any food product, the canner must spare no effort nor expense in the preparation of the sauce. It is the only opportunity offered him to make his product superior to that of his competitors. He must not be too hasty in selecting the formula for the sauce, but should try out a number of formulas until he obtains one which will give him a sauce with a pleasing, appetizing flavor and of a consistency which will make it cling nicely to the spaghetti. He must use raw materials of the highest grade only and should delegate the preparation or cooking of the sauce to an experienced chef.

The quality of a sauce is based on its flavor, color and consistency. Flavor of course demands the foremost consideration. Once a satisfactory flavor has been obtained and its popularity proven, uniformity of flavor must be maintained. To avoid any laxity in this respect, a close supervision of the preparation will be found quite necessary as well as a strict quality control of all raw materials. It is very important that all raw materials used be of the same grade and quality. To be sure of this, no materials should be used until they have been examined and approved by the control chemist. Uniformity of flavor in the sauce is dependent largely on uniformity of raw materials, so that the importance of quality control at this point cannot be stressed too strongly. Certain other factors which influence flavor will be taken up under preparation of the sauce.

The color of the sauce is dependent very largely on the season of the year in which the spaghetti is canned. Fresh tomatoes give the best-colored sauce, provided of course that only tomatoes of good quality are used. If under-ripe or an inferior grade are used, the color will vary accordingly. It is unfortunate, from the color standpoint, that the average canner is unable to pack his year's requirements during fresh tomato season but finds it necessary to can part of it during the winter and spring months, when he is compelled to use tomato pulp instead of fresh tomatoes. Unless he is so fortunate as to have pulp of exceptionally good color, he will find that a sauce made from pulp will not have that characteristic tomato-red color, but will have a color bordering on a dark reddish-brown. The factor of color must not be ignored in the preparation or cooking of the sauce. Careless, inefficient methods of cooking and handling of the finished sauce will have a decidedly harmful effect on the color and should be guarded against.

Good Sauce Has Body

The third factor which governs the quality of spaghetti sauce is consistency. A well-made sauce should have body and thickness. When a can of spaghetti has been heated and the contents have been emptied onto a platter, the sauce should cling to the spaghetti, imparting to it an appearance of richness and wholesomeness. A sauce which does not have this degree of consistency but runs off the spaghetti like so much water makes the spaghetti appear in comparison rather pale and "sickly." Some canners obtain this body or thickness by the amount of cheese used; others attempt to obtain it by the use of thickeners such as cornstarch, cracker meal, or flour. Consistency is an important factor and one to which the canner must give serious consideration when selecting his formula. A sauce may have a beautiful tomato-red color, but its effect will be killed by lack of consistency.

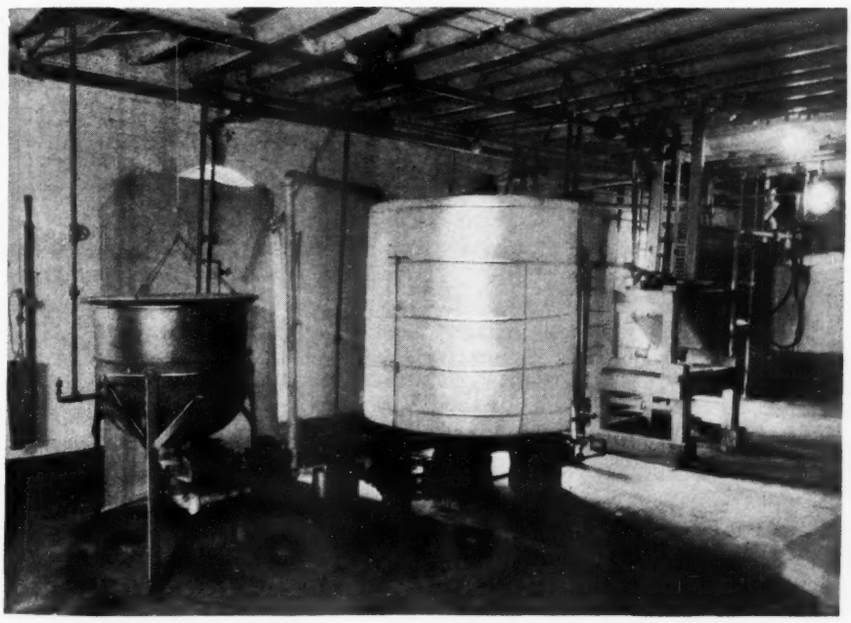
The average spaghetti sauce consists of the following ingredients: tomato juice (cyclone) or tomato pulp, onions, garlic, cheese, sugar, salt, cornstarch, cracker meal, mace, cloves, celery seed, white pepper, thyme, parsley and sodium bicarbonate. No suggestions will be made as to the quantities of each ingredient to be used, as this is a matter to be settled by each canner in accordance with what he considers a tasty sauce. The ingredients must be blended in such a manner that the flavor of one ingredient will not mask the flavors of the other ingredients. It is this blending of flavors which demonstrates the true skill of any chef, and if shrewdly done makes duplication by competitors a very difficult problem.

The sauce should be cooked in either nickel steam-jacketed kettles, or glass-lined or wooden tanks with steam coils. Unlined copper kettles are not advisable, as there is danger of the copper impairing the flavor and color of the sauce. The tomato juice or pulp is first run into the kettle and brought to a boil, at which point the sugar is added, as it has a tend-

ency to "set" the color of the juice or pulp. After all the ingredients are added, the sauce is boiled down to the proper volume. The onions and garlic should be ground fine and added at the beginning of the cook. The cheese, either a sharp Italian cheese or a snappy Cheddar cheese, is ground fine, and added about the same time as the onions, unless a kettle with steam coils is used for the cooking; then the cheese should be added near the end of the cook, as there is a danger of the cheese sticking to the coils and burning. Some manufacturers who use a very sharp Italian cheese, grind it very fine and add a little to each can. This method is not recommended, as it does not become thoroughly mixed with the sauce as when it is added to the sauce while being cooked.

Two methods of adding the spices are used; one method is to make an infusion of the spices by boiling them in water for about forty minutes, draining off the infusion and adding it to the sauce just before the cooking is finished. The other method is to place the whole spices in a muslin bag and suspend it in the sauce during the entire time of the cook. This will prevent small pieces of the spices from getting into the finished sauce and showing up as black specks. The cornstarch, cracker meal or any thickeners used should be made into a cream with water before adding. An efficient way to add the sugar and salt is to make a syrup of them. A quantity sufficient for several batches of sauce can be made at one time, which not only saves the time of weighing out the sugar and salt for each batch, but is also a much more satisfactory way of handling these two ingredients. The sodium bicarbonate should be dissolved in water and added slowly to the sauce. The powdered sodium bicarbonate should not be added, as the sudden reaction between it and the acid from the tomato juice will result in a violent spattering and foaming.

Immediately upon completion of the cooking of the sauce it should be dropped or pumped to the finishing machine. The more heat the sauce is subjected to, the darker the color will be. It is therefore important that the cooking of each batch be so timed that as soon as it is finished it is run out of the cooking kettle. From the finishing machine the sauce is pumped or piped to the holding kettle, where a temperature of 205-210 deg. F. should be maintained. From the holding kettle the sauce is delivered to the saucing machine. The sauce should be stirred constantly while in the holding kettle to keep it uniform.



IN THIS COMPACT, LOW-COST PLANT SET-UP the onions and spices, in bags, are infused in the kettle at the left and pumped into the 500-gal. cypress cooking tank after the other ingredients of the sauce have been cooked and the cheese has been melted into the mixture. In this way the volatile flavors are not boiled off. When all ingredients are thoroughly mixed, the sauce is pumped through the rotary sieve or finisher at the right of the cooking tank. The finisher removes the onion pulp and other lumpy materials to make the sauce ready for use. A motor-driven double-propeller-type mixer mounted on top of the cooking tank assures thorough mixing.

"Sanitary" Piping Used

The type of piping to be used in connection with spaghetti sauce should be either stainless steel or enamel-lined. Spaghetti sauce has a tendency to adhere very quickly to any type of piping; therefore it is important that the piping be so erected that it can be readily taken down at the end of each day and thoroughly cleansed. Stainless-steel "sanitary" pipe is better adapted for this use than enamel-lined pipe; not only can it be more easily taken down and erected, but it is not as easily damaged as enameled pipe. If the cleansing of the sauce piping is neglected for a few days the canner will find that the sauce has burned on the inside of the pipe, forming a black scale which will gradually peel off into the hot sauce as it flows through. If the piping is so erected that it is impossible to take it down each day, the next best thing for him to do is to clean it as well as possible by filling the pipe line with a strong soda solution and allow it to remain in the pipe over night, drain it out in the morning and follow with several flushings of hot water.

Correction: Please refer to the last sentence of "How Spaghetti Is Canned," p. 432, October, 1933, FOOD INDUSTRIES, and add the phrase: "except that No. 10 cans must be cooled under pressure to prevent bucking."

Installing

WASTE DISPOSAL SYSTEMS

In Food Plants

By **FRED ABBOTT FIELDER**
Chicago, Ill.

Fig. 1—An underground piping system for liquid food wastes. Plenty of floor drains and plenty of clean-outs are a fundamental requirement.

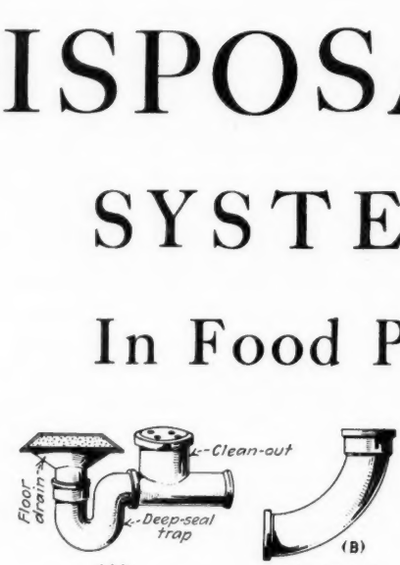


Fig. 2—(*A*) Floor drain for underground piping, with a deep-seal trap and clean-out. (*B*) Long-sweep bend. (*C*) Y branch. (*D*) "Y" clean-out.

SEWER GASES released into a food plant through defective waste-disposal systems endanger the health of workers and contaminate the food product. And the systems of piping for handling liquid food wastes, such as must be removed from dairy plants, are not clearly defined in plumbing codes as are those of the household type. It comes in the category of something the food manufacturer must learn for himself.

The disposal systems may be divided into the underground and the suspended types. Systems installed underground below the floor of a plant (see Fig. 1) should be constructed of cast-iron hub pipe calked at the joints with lead. While many municipalities permit the use of tile "house drains," the cemented joints of these break upon settling and permit the escape of sewer gas. Furthermore, iron piping has fewer joints, being made in 5-ft. lengths, as compared to 2-ft. for tile.

Cast-iron pipe is manufactured in three grades: standard, heavy and extra heavy. The standard is too light—that is, the metal is too thin—to be sufficiently lasting. The extra heavy has the apparently objectionable feature of high cost, but its long life will offset this. However, the heavy grade is satisfactory.

Wrought-iron and steel tubing, of course, are available for these sewage systems. The former can be used underground, but steel tubing is more likely to rust out than cast-iron. The latter is asphalt coated on both sides.

Even though the best quality of pipe be used, the sewage system will not give satisfactory service unless certain precautions are taken in installing it. It is of great importance that all underground pipes have an easy flow, which means that all pipes should be run as directly as possible. All changes in direction must be effected with long, gradual curves (see Fig. 2, *B*), and connections between branches should be made with Y branches (see Fig. 2, *C*), which means that the two lines should meet at an angle of 45 deg.

Another necessary precaution is to make ample provision for rodding the pipes, as most liquid food wastes have a tendency to clog the drains. It is good practice, where local health rules are not prohibitive, to place small rodding basins (see Fig. 3) at connecting points of branch sewers. This will provide ready access to the danger points. Such rodding basins should always be of iron; and they ought to be mounted flush with the floor and provided with iron covers which can be "hermetically" sealed by bolting down against rubber gaskets. Where rodding basins are not allowed, Y branches can be extended from the top side of the pipe to the floor level. These may be closed tightly with brass screw plugs if brass ferrules are calked into the hub of the pipe (see Fig. 2, *D*). Similar rodding basins should be installed just above the floor at the bottom of each riser, or vertical pipe, where it connects to the underground piping. As to the size of drain best suited to carrying away liquid wastes, there is a difference of opinion. Latest sanitary practice recommends for this type of house drain a pipe with a diameter one size smaller than that ordinarily used. This is based on the theory that such sizes will insure more perfect "scouring" of the pipe. Such action prevents the deposition of semi-solid wastes on the sides of the pipe. However, the author prefers to use pipe one size larger than common for such wastes.

An important element in the design of piping systems are the floor drains. These drains should be supplied liberally, and they must be of ample size and be provided with deep-seal traps. If the floor lies directly on the ground, a clean-out near the trap will be needed to permit rodding of the pipe (see Fig. 2, *A*).

Where a public sewer is available, the food-waste-disposal system should be connected independently of the toilet discharge pipes. Where public sewers do not exist, it is important that the food wastes discharge into a receptacle, cistern or sump separate from the septic tank provided for the toilet wastes. This permits the collection of residue, which can be removed from time to time for disposal.

Suspended piping (see Fig. 4) involves problems not encountered with the underground system. Suspended floor drains, in addition to being as large and as deep-seal as the underground type, must be designed to prevent seepage or leakage between the casting and the floor (see Fig. 5). An example of the type of floor drain that will solve this problem in meat-packing plants and dairies is found in the drain made by Josam Manufacturing Co. This design is not exclusive, but illustrates one method of avoiding such leaks.

Suspended horizontal piping ought to be hung below the ceiling for convenience in rodding and to permit periodical examination of all joints. Connections from floor drains and from branch pipes should be made with Y branches, as in the underground system, and a clean-out is needed at the end of each run. This piping may be of the heavy grade of cast-iron hub pipe—usually known as soil pipe—or long lengths of steel or wrought-iron pipe may be used.

In joining up the cast-iron hub pipe, the joints are made by first packing with oakum, which is driven into the hub to prevent the liquid lead from entering the pipe. Then the space above the oakum is poured full with molten lead. Upon cooling and hardening, the lead is packed more closely against the walls of the hub socket with a calking tool. This operation expands the lead and seals all cracks against leakage of liquid or gas (see Fig. 6, *A*).

When wrought-iron pipe or steel tubing is used, the joints are made with special threaded or screwed fittings. These fittings are designed with raised internal parts which eliminate recesses or dams in the conduit such as would occur with ordinary fittings for wrought-iron pipe. This system, known as the Durham, is less likely to develop defective joints upon settlement of the building, being more elastic.

Where local health codes require that all waste-disposal piping be ventilated, each vertical stack must be extended above the roof in a manner similar to that required for toilet waste stacks. In some cases, the main horizontal pipe would be extended to a wall or partition and connected to a vent through the roof.

Ample pitch must be provided for all horizontal waste piping, a fall of $\frac{1}{4}$ in. per foot being satisfactory. Most plumbing codes require such a fall.

Precaution must be taken to protect piping suspended over a cooler or refrigerator. It is advisable to provide a loft over the refrigerator ceiling to make the piping accessible and to protect it against chilling or freezing and the resulting retardation of flow.

In view of the dangers of leakage and sewer gases, suspended piping must be carefully tested before it is put into service. Several methods are permitted, but the water test is the one ordinarily employed. Before the vertical pipes are connected to the house drain, the bottom is plugged or sealed, and all other openings, except that at the roof, are closed. Then the piping is filled with water to the top. This creates a hydraulic pressure that will disclose cracked or defective pipes and imperfect joints. Sometimes the leaks are so small as to be difficult of detection. These can be located by coating the suspended joint with soap suds, as air bubbles will form at the exact point of the leak. Additional tamping of the lead will soon remedy a faulty joint. After all parts of the system are proved water-tight, the pipes should remain under hydraulic pressure for 24 hours.

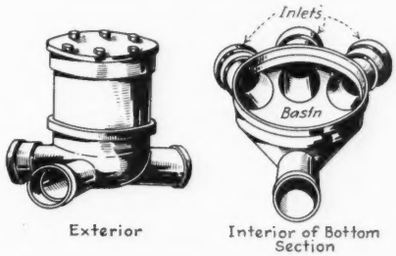


Fig. 3—A rodding basin which is installed at connecting point of branch sewers to provide access at danger points.

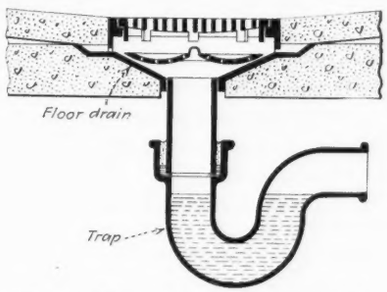


Fig. 5—Floor drain for suspended piping, designed to prevent leakage between the floor and the drain.

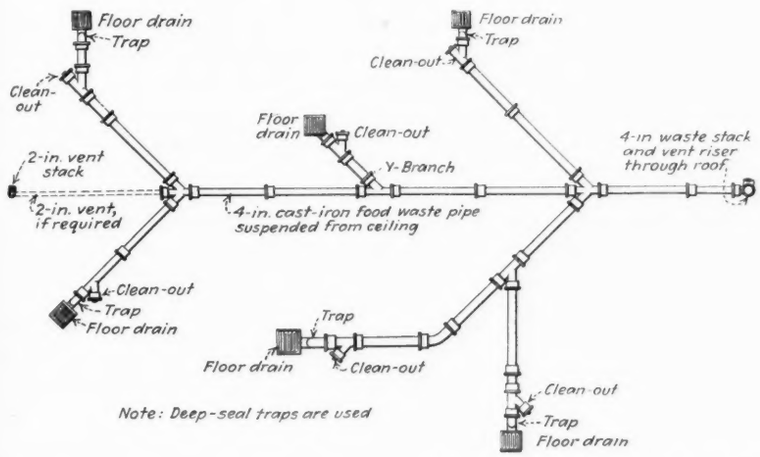


Fig. 4—A piping system of the suspension type.

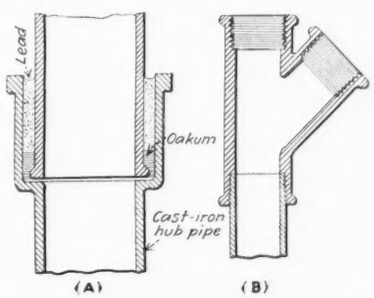
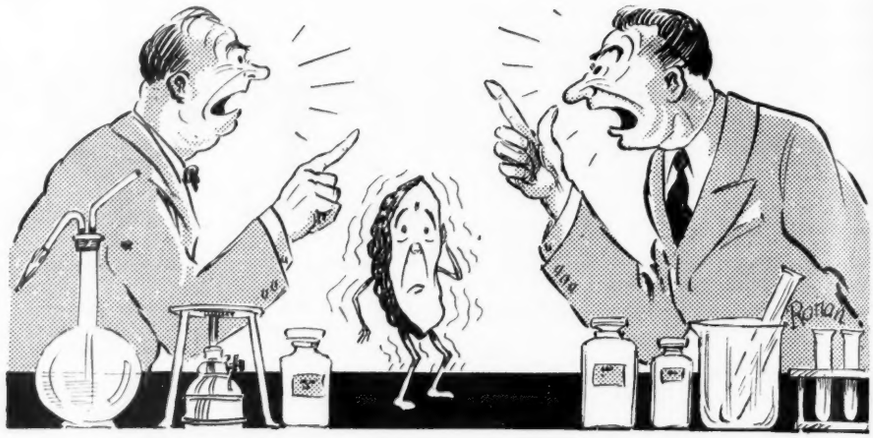


Fig. 6—(*A*) Calked joint in cast-iron hub pipe. (*B*) Y fitting for wrought-iron pipe.

We'll Settle *This* in Court



By WALTER H. GRIMES

AFTER a shrewd indirect cross-examination, the General Manager one day tricked Ben Sauerbeck into a reluctant admission—that he had once been a chemist.

"So you can analyze things in the laboratory?"

"I'm afraid I'm all out of practice," Ben answered guardedly.

"Can you analyze pickles?"

"I used to be able to," was his cautious admission. Ben was often accused of having been everything but a preacher.

"Can you analyze salt stock?"

"Analyze it for what?"

"What would you analyze salt pickles for?" queried the G.M.

"I wouldn't analyze them for anything in the laboratory," Ben replied, beginning to wonder what it would all lead to. The Big Boss' purposes were not easily discerned.

"Why not?" the G.M. came back.

"Simply because you can test for cure, salt and acid right on the job."

"Could you analyze salt stock for alum?"

"Who ever heard of alum in salt stock?"

"I have," announced the G.M. emphatically.

"Well, it's news to me."

"Could you analyze salt pickles for alum?" repeated the G.M.

"Sure; anybody could."

"Then will you please go to the laboratory for me and analyze some pickles for alum?"

So! As Ben suspected, here was another one of those distasteful jobs of the G.M.'s. It was always safe to suspect that something was up when he started one of his long-winded inquisitions.

"Listen, Mr. Terwilliger, we have a good lab. and a good chief chemist. Why not let him do it?"

"No," said Mr. Terwilliger; "I want you to do it."

"A coattail full of boots"

"But I have no status in the laboratory. I work in the operating department. If you ask me to horn in and do chemical work, you are telling Joe that he doesn't know his business, but Joe does!"

"I know," said Mr. Terwilliger, "but this is something very special. Unfortunately, Jake is out of town." (Jake was in charge of manufacturing.)

"But why," persisted Ben, "do you want me to do something that will only get me in wrong and cause friction?"

"Because, I want to get a check-up on him. He reports alum in those four cars of salt stock we bought from Henderson's, where, as you say, alum never should be. Henderson's say we are crazy. I had Joe repeat his analysis, and he still says, 'Alum.'"

"Then there must be alum there," commented Ben.

"That's exactly what I want to believe," said Mr. Terwilliger. "But here is my situation: We have had those pickles for nearly three weeks while we have been arguing over the alum. In the meantime, the market has gone up. If we rejected the shipment it would suit Henderson's fine. They would resell it for a $500 profit. We say we bought four cars of good salt stock and insist on delivery of good salt pickles. But Joe says they have alum in them. We couldn't use alum pickles, even if they gave them to us for nothing. So our game is to hold them, refuse payment and demand replacement with good stuff at the old price.

"Do you know Gus Alderman, the 'big shot' of Henderson's?" he continued.

"Yes, I met him once."

"Then you can imagine the chin music I've had to take on this pickle deal. He says, 'No alum, pay us'; we say, 'Alum, send good pickles.' He says we're nuts! We say, 'We are right. Send good pickles.' He says, 'Send them back,' if we don't want them, 'or pay now.' We say, 'Alum' again—and he says, 'No alum!' and 'pay up.' There you are. I want to check up on Joe."

"Well, if that's the kind of a check-up, you had better send them

to a consulting laboratory," Ben suggested.

"What!! And let that son of a gun think I'm not sure of my position?"

"Well, aren't you?"

"Certainly. I merely want somebody else in our organization to check up before I make the next move."

It took all of Ben Sauerbeck's diplomatic ability to smooth things over in the laboratory after Mr. Terwilliger had telephoned Joe what he wanted Ben to do. What else could be expected? After all, chief chemists don't care to have men from the operating department messing around their laboratory, much less trying to check up on their accuracy.

But it all would have ended perfectly had not Ben inadvertently burned a hole in Joe's favorite platinum evaporating dish. Joe cursed Ben roundly for that mishap, telling him, among other things, that as a chemist he would make one damned good blacksmith.

"Burned a hole in Joe's favorite platinum dish"

But Ben found alum in the salt pickles, just as Joe had done twice before.

"Well, what's our next move?" asked Mr. Terwilliger, when Ben made his report.

"Why not let me call on Alderman."

"And get your coat-tail full of boots? What do you plan to accomplish?"

"I'll prove somehow that the alum is there."

"O.K., Ben. But stick to your guns! One stumble and we are out $500." The G.M. always could figure a way to get someone else to volunteer to tackle the mean jobs that he didn't want to do.

Ben called at the office of Henderson & Co. early that afternoon, sent his card in to Augustus Q. Alderman, president, and sat for three long, weary hours on a hard bench—just waiting. Mr. Alderman always took a malicious delight in high-hatting Mr. Terwilliger or anyone from his concern. This time his sense of propriety was outraged that Ben Sauerbeck instead of old Terwilliger himself had come over to be humiliated. It didn't show proper respect, and Gus Alderman would show them a thing or two.

"Bulletin 107—"

It was 4:30 when Ben was shown into the president's office.

"What can we do for you, Mr. Sauerbeck?" inquired Mr. Alderman, eying him coldly.

"Just came to talk about that shipment of brine stock you sold us through the Blotto Brokerage Co."

"Did you bring a check to pay for it?"

"No, I didn't. I merely came to talk things over. It's funny about alum being in salt pickles."

"Mr. Sauerbeck, if you harbor the delusion that there is alum in those pickles, there is only one thing to say."

"What's that?"

"Nuts!"

"But the alum is there," persisted Ben.

"I tell you there is no alum there."

"How do you know?"

"Because our chemist says so."

"Mr. Alderman," Ben began very slowly in his most impressive voice, "I have analyzed those pickles myself, and the alum *is* there, and I can prove it any time you want."

"Impossible!" shouted Mr. Alderman. "You're crazy! You're nuts! You and your whole outfit!"

"Wait a minute, wait just a minute, Mr. Alderman. You might have to eat those words some day. In the first place, you don't know anything about those pickles. All you have is another person's word for it——"

"So I don't know what I am talking about, eh?" Mr. Alderman jumped to his feet, his eyes mere slits and his jaw muscles working hard. "Go tell Mr. Terwilliger that we'll settle this matter in court!"

But Ben sat tight. There was a moment of awkward silence before he spoke.

"In the event of a trial, the Judge will decide the case not on your chemist's analysis nor on ours but on a referee analysis by a reputable outside laboratory——"

"And they won't find alum!" interrupted Mr. Alderman.

"Disagreements are what make the lawyers rich, Mr. Alderman," said Ben. "Now, let's have your chemist and our chemist get together and run separate analyses on the same sample, in the same laboratory. We'll split 100 pickles lengthwise and each take half. Obviously, somebody is in error on method. What method does your chemist employ, Mr. Alderman?"

Mr. Alderman, calming down rapidly, telephoned to the laboratory. Turning to Ben, he said: "We use the method for determining aluminum given in Bulletin 107 of the Bureau of Chemistry, U.S. Department of Agriculture. Never heard of that, I suppose."

Ben ignored the dig.

"You have your chemist at our plant next Monday at 10 o'clock, and we'll run the joint test. If we are wrong, we pay, *pronto*. If you are wrong, it's up to you to make good."

* * *

Ben was worried, for he had never heard of Bulletin 107. Stopping at the Public Library on his way home, he looked up a copy. It described a method of determining soluble alum-

"Ben met a very unhappy looking chap"

inum in soils. After a little figuring he saw the light. If followed literally, that method would never reveal the presence of alum if it happened to be there.

* * *

At 3 o'clock on Monday afternoon Joe 'phoned to Ben that the tests were over. Ben went down and met a very unhappy looking chap.

"I am afraid," admitted Henderson's chemist, "that I have made an

error in my method. You folks are right. There is alum in the pickles. I will have to reverse my report to Mr. Alderman. Good-by."

* * *

On the following Thursday, the information desk sent in to Ben the card of A. B. Helmle, production manager of Henderson & Co., who was promptly admitted.

"Mr. Sauerbeck," said Mr. Helmle, "I have come to bring our apologies to you and to make whatever settlement is right on this pickle shipment."

"Apologies are unnecessary, Mr. Helmle; it's all in the day's work. As for the settlement, I think that you and Mr. Terwilliger ought to work that out. He started the deal. You can do one thing for me, however."

"Gladly."

"Well, strictly in the lodge, what in the world was the idea of alum in salt stock? It's beyond us."

"Mr. Sauerbeck, it is just as much of a mystery to us as it is to you. We never heard of alum in brine pickles before and we never have had any alum at any pickle station in my time. In fact, we have not used alum anywhere for at least twenty years. Therefore it could not have been an accident. My only hunch is that one of our salting-station foremen may have found some slippery pickles and bought the alum himself, thinking to cover up his own carelessness. But even that theory is rather weak."

"Funny things happen in the pickle business, Mr. Helmle," said Ben, "but I do regret this incident because Mr. Alderman will always hate me because I proved he was wrong."

"Don't be so sure about that, Mr. Sauerbeck. He nearly fired me for this whole matter, and told me to get a new chemist. In fact, he suggested that I ask you to take the job!"

"But I am not a chemist," protested Ben, thinking of the ruined platinum evaporating dish. "And our laboratory can prove it!"

Taking the Mystery Out of A New Car of Flour

(Concluded from page 437)

chemical and enzymic dough developments are not broad enough to be cared for in the shop by slight changes in these three factors is too "touchy" for practical use and should be rejected as not being uniform. If, in going from one car of flour to the next, it is found necessary to adjust baking factors other than these three, there usually is something wrong with the flour.

If on the first car of flour (baked by the plant standard formula and procedure as far as the laboratory has facilities to follow it) the absorption is found to be 65 per cent on an "as received basis" with a dough mixing time of 4 minutes and dough fermentation time of 30 minutes, the superintendent would note all these items, but would not try to change the various stages of his plant operations to the exact times and consistency figures as reported from the laboratory. He would be careful, however, to see that his bread was satisfactory and that his operating conditions were based upon the same flour as was reported from the laboratory. It would be on the next car of flour that the laboratory would begin to be of help to him.

On the second car the laboratory finds the absorption to be 64 per cent, whereas on the first it had been 65 per cent. The laboratory decreases its dough mixing time from 4 minutes on the first car to 3½ minutes on the second, and it finds the dough fermentation has to be lengthened from 30 minutes on the first car to 35 minutes on the second, and so reports. By so doing the laboratory has interpreted its findings into terms that can be used by the baker. The superintendent is not confused by protein, ash, viscosity or any of the chemical terms which cannot be baked. The bakery superintendent knows exactly from such a report what points in his manufacturing process to watch for trouble.

He at once turns his attention to interpreting the change in these factors in terms of the shop. As he does not know exactly how much these three factors should be changed, all he can do is to make a slight change in each factor in the direction indicated on his laboratory report and continue to make little changes until his bread is where he wants to hold it. In so doing, the plant absorption may be decreased ½ per cent, whereas the laboratory had to change 1 per cent. Then a 1 per cent absorption change in the laboratory becomes a ½ per cent change in the plant. The plant may find that 1 minute has to be cut off the dough-mixing time. As the laboratory cut only ½ minute, a ½ minute cut in dough-mixing time in the laboratory equals 1 minute in the plant. The plant may find that 10 minutes had to be added to its dough time in going from the first to the second car, whereas the laboratory had to add only 5 minutes at this point. Therefore, 5 minutes in the laboratory equals 10 minutes in the shop.

By working in this way, not many cars will be used before the superintendent is able to predict very closely from his laboratory report how much of a change will be required in his plant procedure when he starts to use a new car of flour. Hence, the guesswork is largely removed from the shop; and, if a flour differs too widely from the standard set, the car can be rejected or diverted to other uses.

We have seen bakings in two different bakery laboratories where the identical type of bread was made in testing the flour as was being produced in the bakeshop. In these laboratories many of the baking factors (such as fermenting temperatures, absorptions, sponge flour and the like) were the same in test baking as in actual production. The procedure is so practical that the president of one company (in which one of these bakery laboratories operated) has informed me that a new type of bread was developed in the laboratory and transferred to actual plant production with only one change in the method. This was a change of 5 minutes in the dough fermentation time. In a third bakery laboratory, the chemist has produced his testing procedure to include as much of the actual plant facilities as possible. He uses the plant dough room for his fermentations and the plant machinery for his make-up. By such methods, bakery laboratories are able to furnish to the plant superintendent advance information concerning flours and help guide operations.

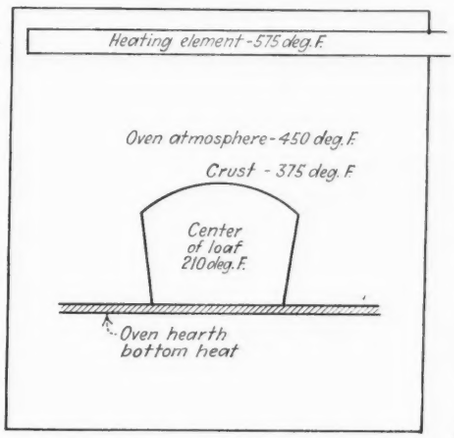
Externally Fired BAKE OVENS

Give *Flexibility* in Choice of Fuels

By HARRY CARLTON
New York, N. Y.

ALTHOUGH the material-handling function of bake ovens holds great importance in the cost of operating bake shops under the present N.R.A. program, the possibility for cutting production costs by a more intelligent fuel selection and heat application to the ovens should not be overlooked.

While fuel cost and heat utilization are problems that have to be faced by all food manufacturers, they are particularly vital to those whose plant equipment includes bake ovens. Too often these manufacturers do not fully realize the expense of operating an oven and have not heretofore had such a strong incentive to look into the economics of their baking or drying operations.

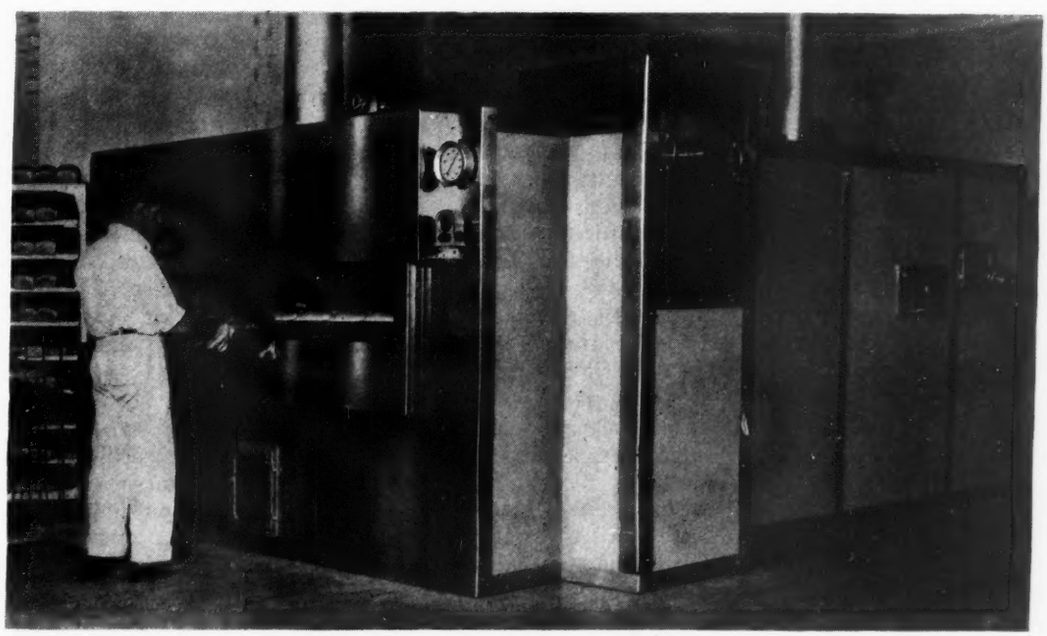


Time and temperature are the two fundamental factors upon which the baking operation is based.

Oven developments during the last decade has made available every type of oven from a hand-fired, hand-loaded peel to an automatically fired, automatically loaded flat-hearth traveler; with various rotaries, reels and traveling trays in between. This line-up represents ovens for every type of loading and conveying, and all plant capacities. Fuel-burning equipment and methods of heat distribution have kept pace and are factors in the economic operation of ovens second only to the construction of the oven itself.

In terms of the baking industry a

An externally fired oven of the latest type adaptable to using either oil or gas fuel has recently been put on the market by the Crawford Oven Co. It handles from 700 to 1,500 one-pound loaves per hour, depending upon length, width and number of trays.



bake oven is fundamentally an inclosed space provided with some means for supporting the dough and capable of being sufficiently heated to produce the changes in the dough which we call baking.

Just what the chemical changes are remains one of the mysteries still unsolved by science. We may talk learnedly of coagulation of proteins, gelatinization of starch granules, partial dextrinization of starch and caramelization of sugar in the crust formation, of the destruction of the yeast and of enzymic activity. But we still do not know just what happens when heat is applied to that queer plastic mass resulting from the mixing and fermenting of flour, water, salt, yeast and the sugars: sucrose, dextrose and malt; to say nothing of milk, fats, or trademarked compounds and mixtures which may have been added because of the experience or whim of the baker, at the solicitation of salesmen, or in the name of economy.

The summation of knowledge gained through some twenty-two centuries of bread baking leads to the conclusion that, whatever takes place inside the loaf, only two essential factors are involved: time and temperature. Both vary according to the size and character of the loaf. The time of baking, on an average, is from 30 to 40 minutes; temperature, 400 to 450 deg. F. During the bake the center of the loaf reaches a maximum temperature of 210 deg. F., and the crust about 375 deg. F.

Granting these premises, oven building becomes simply a matter of providing means to retain the heat, to carry the dough, to give proper ventilation, to insure means for complete combustion of fuel, and to apply the heat in proper manner to the dough.

Bake-oven heating systems may be classified broadly as "inside fired" or "externally fired." The latter is more generally used at the present time in the construction of new ovens.

Inside firing means literally burning the fuel inside the baking chamber. The disadvantages of this method with the solid fuels—coal, coke and wood—are obvious. Gas may be used without detriment to the finished product, and its extreme flexibility makes it an attractive fuel for either inside or outside firing. No other fuel responds so quickly to varying heat demands. Its drawback for inside firing is the possibility of unburned gas from accidentally opened, unlighted or extinguished burners, filling the baking chamber, becoming ignited, and causing rather serious explosions.

Improvements in oil-burning equipment have produced a perfect combustion, making possible inside firing with oil without contamination of the dough; but if by any unlucky chance combustion be not complete, a film of unburned oil may be deposited on the dough and the entire batch ruined. Such may happen when starting with a cold firebox or if the equipment be adjusted for too little air.

Electricity is not a fuel and of course gives off no combustion or other gases in the baking chamber. For a short time it was used quite extensively. It bridged the gap between the direct, inside fired gas oven and the present indirectly fired gas and oil ovens and overcame any prejudice against combustion gases in the baking chamber as well as the fear of explosion. The development of external firing and indirect heat application accomplishes both objects at a much lower cost for both ovens and fuel. While electricity has a popular consumer appeal, the higher costs for both ovens and fuel more than offset this except in a few special cases where the cost of gas is unusually high in relation to cost of current. Dollar city gas equals 1-cent electricity is a rule-of-thumb comparison of the costs of the two methods of heating.

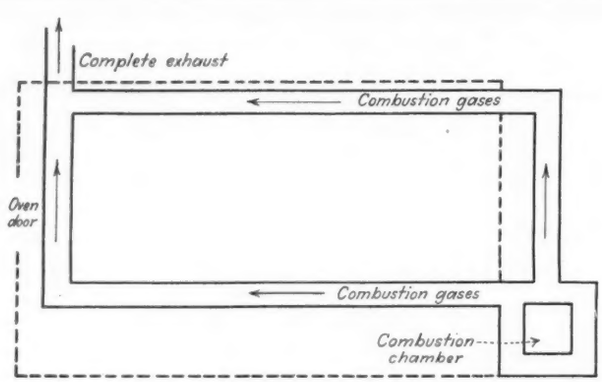
The externally fired oven has the combustion chamber entirely separated from the baking chamber. Four methods of distributing the heat from the firing chamber are now employed by the various manufacturers:

1. In the *Inclosed Through-Duct* system the flue gases are distributed through the oven and then exhausted to the atmosphere.

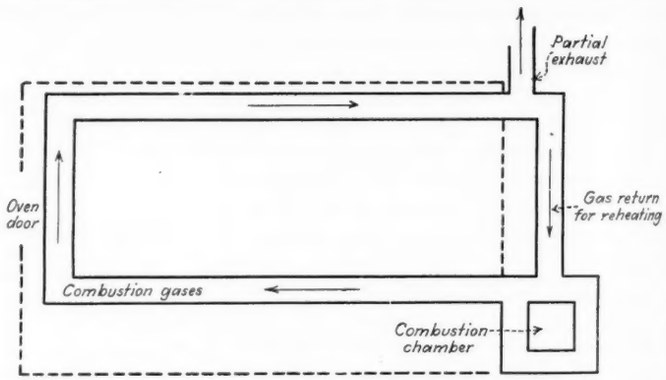
2. In the *Inclosed Recirculating-Duct* system a portion of the gases are returned to the combustion chamber, reheated and again circulated through the oven heating flues.

3. In the *Direct Recirculation* method the heated gases are discharged into the baking chamber itself, and a portion is returned to the combustion chamber and reheated. This method usually is limited to gas as being the one fuel which cannot injure the dough.

4. The *Steam-Pipe* method consists of a number of steel tubes approximately 2 in. in diameter. The length depends on the type and size of the oven to be heated. These tubes are sealed at both ends and contain a liquid—presumably distilled water. They are distributed above and below the hearth so as to give proper heat distribution in the baking chamber. The lower end of each tube is exposed to the heat in the combustion chamber. As heat is applied to the ends, steam is generated; circulation



Flue gases circulate through and escape to atmosphere in the "Inclosed Through-Duct" system of heating an oven by external firing.



In the "Inclosed Recirculating-Duct" system a portion of the gases is returned to the combustion chamber for reheating and recirculation.

of the liquid results within each tube and heat is transmitted to the baking chamber. While heated from a common source, each tube is a separate and independent heat transfer system.

The pressures are necessarily high. In order to transfer heat and maintain a baking temperature of 450 deg. F., the tube must operate at a temperature of at least 575 deg. F. The saturated steam tables show the pressure corresponding to this temperature to be approximately 1,300 lb. per square inch.

This method appears to be one of the oldest practical indirect and continuous methods of heat transfer. It is believed to have been invented in 1836, but was not applied to bake ovens until 1864. Now it is applied to bake ovens of all types.

All methods except the third, the direct recirculation of combustion gases, are indirect methods of heating.

With the modern external firing chamber the industry approaches the point where a baker can install the type of oven which will be adaptable to present and future types of products and production schedules without committing himself definitely and forever to any one fuel. This means that he may choose an oven as he would a house suitable to his tastes and needs, equipped with the heating system he prefers, and using the fuel most convenient and economical at the time.

The future prices of fuels need not be given as much consideration as formerly, as it usually is possible to change from one to another without disturbing the oven proper, and at comparatively moderate expense for changing over the firing chamber.

Assuming proper fuel equipment and adjustment, the kind of fuel used will not affect the quality of the product. It has been definitely established that any fuel can be used successfully by one or more systems.

The quantity of heat actually absorbed in the process of baking a pound of bread and heating the pan is the same regardless of the kind of fuel used. It has been demonstrated that under average conditions a pound of bread requires a heat input of about 235 B.t.u. This will vary with the nature of the dough, the weight of the pans, the extent to which the baking is carried, and several other factors.

By removing from consideration the question of quality and the quantity of heat absorbed, the variables in the choice of fuels practically narrow down to the local cost of the fuel, the cost of handling and storage, the cost of the necessary apparatus to apply the fuel, and the efficiency of the fuel.

A common mistake in comparing the cost of fuels is to base the figures on the heat content of the fuel—the price paid per B.t.u. But all fuels are not equally efficient.

Gas is delivered to the burner prepared for combustion when the necessary amount of air is added. "Nothing but gas burns" is one way of saying that all solid and liquid fuels must be converted into gas before they can be burned. The conversion is accomplished by the application of heat. This preheating uses up some of the heat content of the fuel during the process.

Some fuels require the admixture of more air than others to produce complete combustion. Air is approximately 80 per cent nitrogen, an inert gas which does not assist in combustion but must be heated up with the other 20 per cent. Then we have varying conversion losses, flue gas losses, overhead charges, and the like to consider.

The following table, based on actual experience and tests, gives a comparison of the over-all efficiency of various fuels. It is on the basis of baking 1,000 lb. of dough.

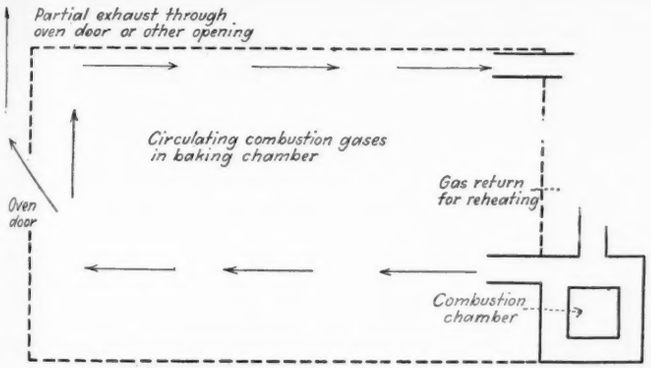
Kind of Fuel	*Quantity Used*	*B.T.U. Content*
Anthracite Coal ...	60 lb.	826,000
Oil (28/32 Baumé)	4.8 gal.	681,000
Oil (14/16 Baumé)	4.5 gal.	684,000
City Gas (550 B.t.u.)	900 cu.ft.	495,000
Natural Gas (1100 B.t.u.)	450 cu.ft.	495,000
Electricity	108 kw.-hr.	368,000

The actual heat required to bake 1,000 lb. of dough is approximately 235,000 B.t.u.; therefore the fuel efficiencies will be in general as follows:

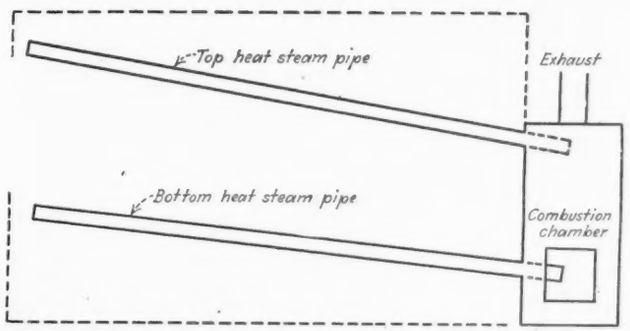
Kind of Fuel	*Efficiency Per Cent*
Anthracite Coal	28.5
Oil (28/32 Baumé)	34.5
Oil (14/16 Baumé)	34.4
City Gas (550 B.t.u.)	47.5
Natural Gas (1100 B.t.u.)	47.5
Electricity	64.0

These efficiencies are in terms of fuel and bread baked, and include the usual operating losses in combustion: flue losses, oven-wall radiation, and door losses. With these figures as a basis, together with the delivered cost of the fuels, an approximation of the cost comparison can be arrived at.

Regarding heating systems and fuels as general in application to all types of ovens, the adaptability of the various peel, rotary, reel, tray and flat-hearth traveling ovens to labor and production requirements is a mechanical question and will be considered from the construction and material-handling angles.


Partial exhaust through oven door or other opening
Circulating combustion gases in baking chamber
Oven door
Gas return for reheating
Combustion chamber

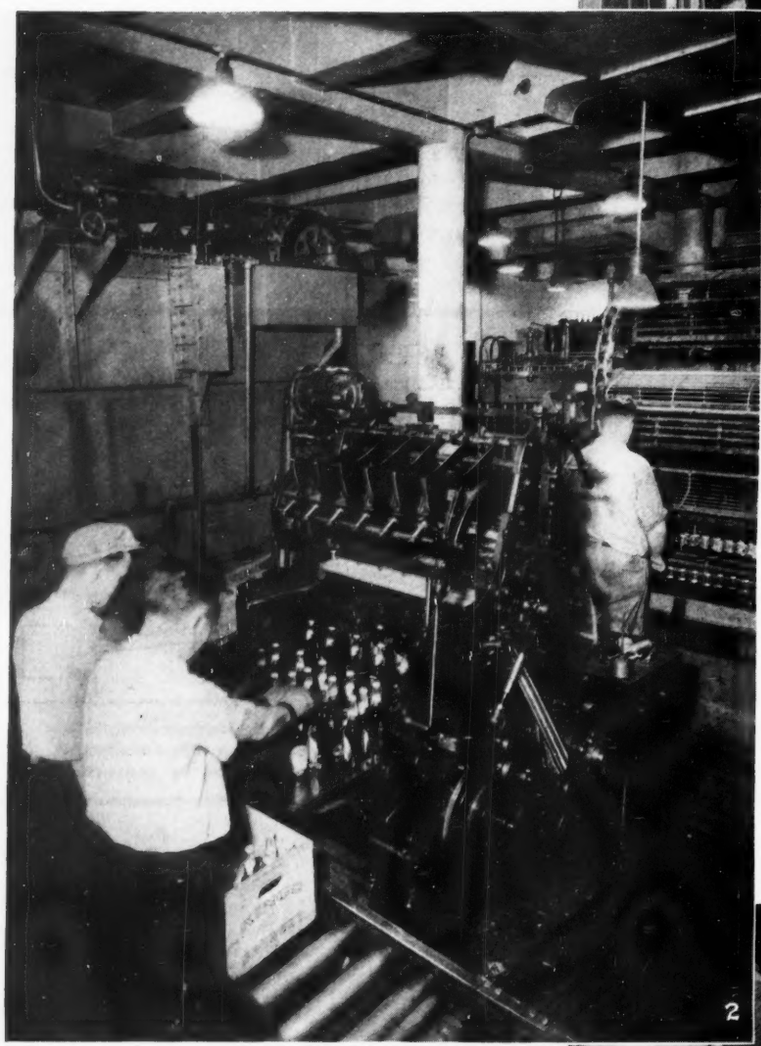
The "Direct Recirculation" method of heating by external firing usually is limited to ovens using gas fuel. Gases from other fuels may damage the dough.



In the "Steam-Pipe" method of heating an oven, tubes sealed at both ends and containing a liquid are heated at one end. Heat reaches the oven by convection.

HIGH-SPEED LABELING

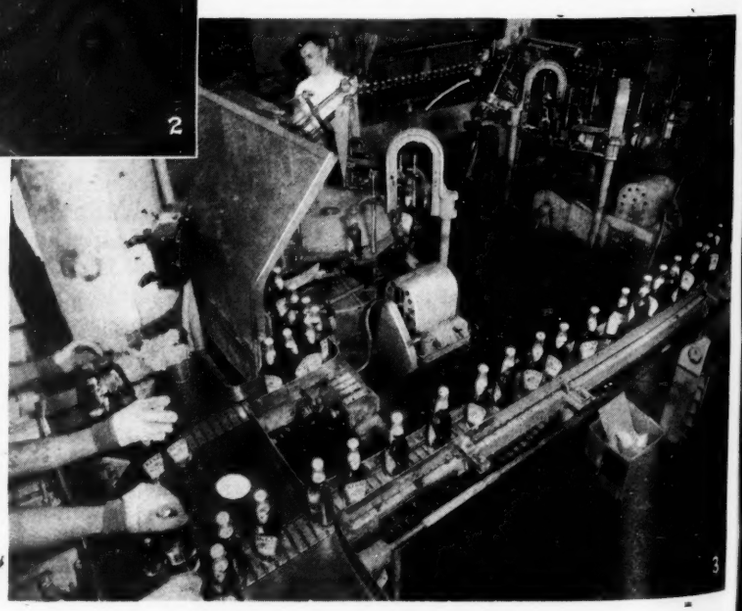
IN KINGS BREWERY, Brooklyn, N. Y., two Ermold 6-wide Automatic Multiple labelers (1) spot labels on bodies and necks of 240 12-oz. bottles of beer per minute. These two machines handle the output of a 40-bbl. per hour Barry-Wehmiller traveling-tray pasteurizer.



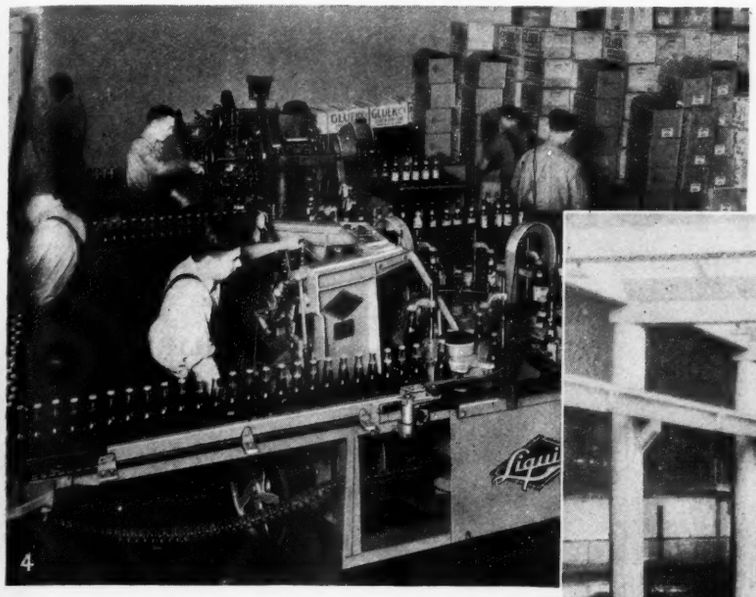
A third 6-way Ermold multiple labeler (2) handles the output of a 20-bbl. per hour Barry-Wehmiller pasteurizer.

These five labeling machines give the bottling plant of this brewery a production capacity of 510 12-oz. bottles per minute. Following the legalization of beer these fully modern machines ran 24 hours per day converting the 95,000-bbl. lager storage into labeled bottle beer.

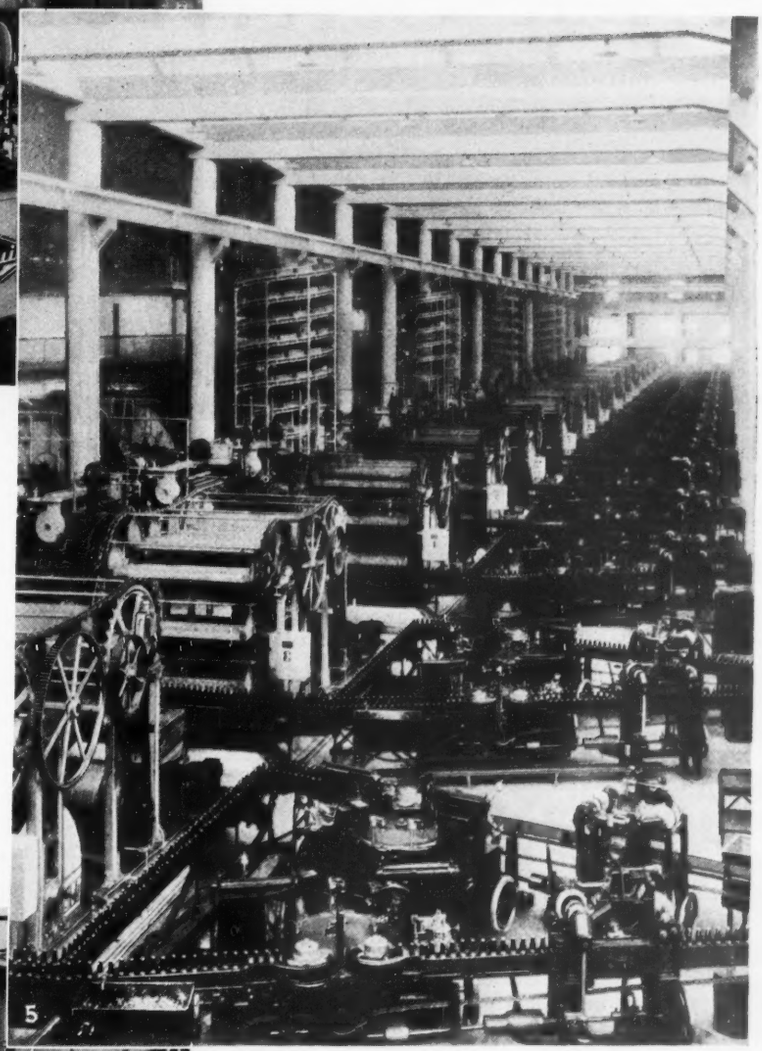
Two single Liquid-O. & J. labelers (3) complete a Liquid Carbonic Corp. 150-twelve-ounce-bottle-per-minute installation of bottle washer, filler, capper, pasteurizer and labelers.



AIDS RETURN OF BEER

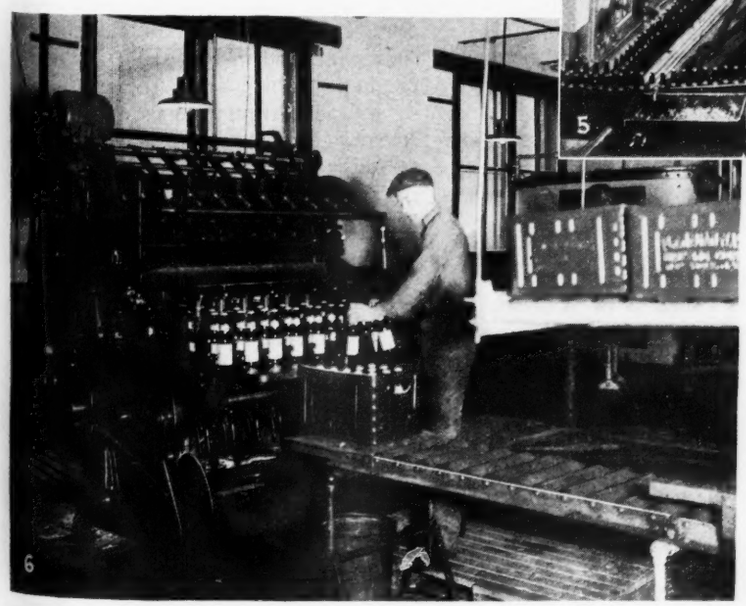


GLUEK BREWING CO. bottling plant (4) at Minneapolis, Minn., has two Liquid-O. & J. duplex labelers which handle 100 bottles each per minute.



ANHEUSER-BUSCH bottling plant (5) at St. Louis is reputed to have the largest labeling capacity in the world. Thirty-four Liquid-O. & J. single labelers place body labels and neckbands on 2,550 twelve-ounce bottles per minute.

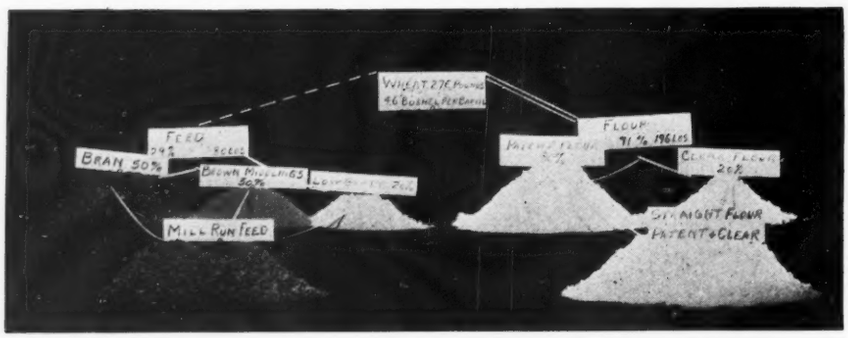
FLANAGAN-NAY BREWING CO. plant (6) in New York City recently installed the newest high production labeler, an Ermold 8-way unit. Its production rate is 160 bottles per minute.



Flour Milling

Is Not Merely GRINDING

....But *Selective* GRINDING



IN MILLING WHEAT the quality and quantity of each end product depends largely upon the raw material selected for grinding.

By C. G. HARREL
and
R. C. BENSON
Products Control and Bakery Research Department Pillsbury Flour Mills Co., Minneapolis, Minn.

IN the present-day production of mill products the selection of raw materials is of utmost importance. Large milling organizations have departments whose specific work is the selection of wheat most suitable for the types of flour to be manufactured. These selection departments have been so organized that during a crop movement they usually maintain a field unit whose duty it is to obtain and forward samples to some central point for subsequent milling, analysis, and test baking. The wheat selected may be grouped into hard spring and winter wheats for bread; durum wheat for macaroni and similar alimentary pastes; and soft winter wheat for cake, pastries and crackers.

The simplest of the milling processes is the production of whole-wheat flour. This is made from the finest, cleanest spring or winter wheat obtainable. Spring wheat, because of its higher protein and superior baking strength, is generally preferred for whole-wheat flour. After thorough cleaning and washing, the grain is milled or reduced by means of millstones or steel rolls to the granulations shown in Table I. An idea of whole-wheat granulation may be obtained from Fig. 2. This illustration shows the progressive changes in appearance as whole wheat is made successively finer.

Essentially the milling of white flour implies the separation of the center portion, or endosperm, from the outer coating, or bran portion, of the wheat berry. The endosperm, consisting chiefly of starch and the proteins that form gluten in the dough, subsequently undergoes gradual reduction to a fine, impalpable state. The germ of the berry also is separated to enhance the keeping quality of the flour.

After the wheat has been thoroughly cleaned and washed it is ready for conditioning. This, the first step in the white-flour milling process, consists in preparing wheat for the mill so that the bran coatings become somewhat pliable, which facilitates a separation of the bran from the endosperm. "Tempering" is the treatment of the dry wheat with water of a definite temperature over a period of time in which the dry, brittle bran thereby softens and becomes pliable.

After tempering, there are seven steps in the modern roller process of milling: breaking, sifting or separating primary products, purifying, reducing, bolting, flour blending, and bleaching.

Step 1—Breaking is accomplished by passing the wheat between large steel rolls with corrugations; this is called the "first break."

Step 2—Sifting is applied to the cracked wheat obtained from the first break and results in the products shown in Fig. 3.

At the top we see the cracked wheat from the first break, which, after sifting, gives us the three products shown below it. The break flour requires purification but no further reduction, and in this sense is an end product. Third from the top is observed the large pieces of the endosperm (known as first middlings) mixed with bran particles ready for the purifier. At the bottom we see the large pieces of grain (second-break stock) requiring further reduction and ready for the second-break rolls. After the second-break stock goes through the rolls it is sifted in similar manner, resulting in second-break

Table I—Whole-Wheat Granulations in Per Cent and Their Baking Qualities

Type of Whole Wheat	Top of 18 Wire	Through 18 Wire On Top 34 Wire	Through 34 Wire On Top 54 Wire	Through 54 Wire On Top 84 Wire	Through 84 Wire	Total	Volume Baked Loaf C.C.	Texture and Grain
Coarse	7.2	26.4	20.4	15.2	30.8	100.0	1,581	Coarse and rough
Medium	1.0	5.8	25.2	20.6	47.8	100.0	1,782	Much smoother and softer than preceding
Fine	0.0	0.8	7.0	18.8	73.4	100.0	1,906	Smooth and silky

MILLED PRODUCTS AND THEIR USES

Legend

X – Used alone or with another product
W – Always used with a product marked X
H – Flour should have a high protein content (13-15%)
M – Flour should have a medium protein content (11-13%)
L – Flour should have a low protein content (9.5-11%)
S – Straight flour (a combination of patent, clear and low grade flours) may be used for this article
O – Purified, when used for food
✻ – Sometimes milled to flour for certain products

Final Product	Hard Wheat: Milled Products: Flour 72%: 80% Patent	17% Clear	3% Low grade	49% Bran	1% Germ	30% Brown middlings	20% Low grade	Hard Wheat: Milled Products: Feed 28%: Coarse	Medium	Fine	Hard Wheat: Whole Wheat 100%: Granulation: 30% Top patent	60% Center patent	7% Clear	Soft Wheat: Flour 74%: 3% Low grade	49% Bran	1% Germ	Soft Wheat: Feed 26%: 30% Brown middlings	20% Low grade	60% #No.1 Semolina	20% No.3 Semolina	Durum Wheat: Semolina and Flour 72%: Durum first clear	70% white or patent	30% Dark	Durum Wheat: Feed 28%: Rye middlings	Rye: Milled Products: Flour 83%: Coarse	Medium	Fine	Rye: Milled Products: Feed 17%: Rye Meal 100%: Granulation
Baked Products																														
Biscuits	LXS	LS	LS								LXS	LXS	LS	LS																
Biscuits, wheat germ	LXS	LS	LS		W						LXS	LXS	LS	LS		W														
Bread, pumpernickel	WS	WS	WS																			W	W		X	X	X			
Bread, rye	W	W	W																			X	X							
Bread, wheat germ	MXS	MS	MS		W										W															
Bread, white	MXS	MS	MS																											
Bread, whole wheat								HX	HX	HX																				
Cake	LX										LXS	LS	LS	LS																
Cake, fruit	LXS	LS	LS																											
Cookies	LXS	LS	LS								LXS	LS	LS	LS																
Crackers, graham								LX			LXS	LS	LS	LS																
Crackers, white											LXS	LS	LS	LS																
Doughnuts	LXS	LS	LS								LXS	LS	LS	LS																
Hard tack																										X	X	X		
Hearth bread and rolls	HXS	HS	HS					W	W	W												W	W			W				
Ice cream cones											LXS	LS	LS	LS																
Muffins	LXS	LS	LS	W				W	W	W					W															
Pancakes	LXS	LS	LS					W	W	W	LXS	LS	LS	LS						W		W								
Pastry	LXS	LS	LS								LXS	LS	LS	LS																
Pie crust	LXS	LS	LS								LXS	LS	LS	LS																
Pretzels											LXS	LS	LS	LS																
Puddings	X										XS	XS	S	S																
Self rising flour											LXS	LS	LS	LS																
Alimentary Pastes																														
Macaroni																														
Bologna type																			X	X										
Genova type																			X	X										
Naples type																			X	X										
Noodles																			X	X										
Ravioli																			X	X										
Spaghetti																			X	X										
Vermicelli																			X	X										
Breakfast Foods																														
Bran flakes														X																
Farina																			X											
Wheat germ					X										X															
Whole wheat									X																					
Animal feeds																														
Calf feed							X										X													
Dairy feed				X		X										X					X								
Dog biscuit			X	W	W	W			X				X	W	W	W														
Fox food			X	W	W	W			X				X	W	W	W														
Hog feed				X	X	X									X	X											X			
Poultry feed				X	X	X									X	X														
Miscellaneous																														
Alcohol			LX				LX						LX				LX													
Asbestos board			X										X																	
Blood sausage	X	X	X																											
Cleaning rugs, furs, and fabrics				X			X							X				X	X											
Confectionery		X	X									X	X	X																
Dextrine	S	S	S								S	S	S	S																
Dry cell, electric batteries			X											X																
Filler for cotton goods			X											X						X										
Foundry molds			X											X						X										
Glucose	S	S	S								S	S	S	S																
Glue			X											X																
Gluten flour	HS	HS	HS																											
Malted milk and baby foods	S	SX	S								S	S	SX	S																
Maltose	S	S	S								S	S	S	S																
Oil, wheat germ					X										X															
Paint sizing			X											X																
Paint undercoat			X											X																
Paper sizing			X											X																
Paste			X											X																
Plastics			HX																											
Polish																									X					
Rug sizing			X											X																
Rubber			X											X																
Salad dressing	S	S	S								S	S	S	S																
Soup, wheat germ					X										X															
Starch	S	S	S								S	S	S	S																
Talcum powder											S	S	S	S																
Thickening; gravy, soup	XS	S	S								S	S	S	S																
Wall paper cleaner			X											X																

flour, second middlings for the purifier, and third-break stock. This cracking is kept up for five breaks—or, in other words, until no more endosperm can be separated by breaking. Thus from the five breaks we obtain five different break flours, which constitute about 10 to 12 per cent of all the flour.

The first middlings stock (top of Fig. 4) is conveyed to the purifier, in which air currents remove loose bran particles and grade the middlings by a screen separation into uniform sizes. Purifying constitutes *Step* 3 in milling. From the purifier receiving the first middlings stock we obtain the purified middlings shown in the middle of Fig. 4. At the bottom is the offal, or bran particles. The purification process is applied to the middlings from all five breaks. It is interesting to note that these purified middlings form the basis of some breakfast foods. Purified middlings from hard wheat are known as farina.

A similar product made from a durum wheat is technically called "semolina." Semolina is the main product in durum-wheat milling, consequently much of the milling ceases after the purification of the middlings, or semolina. Fig. 5 shows various semolina granulations and the offal durum flour.

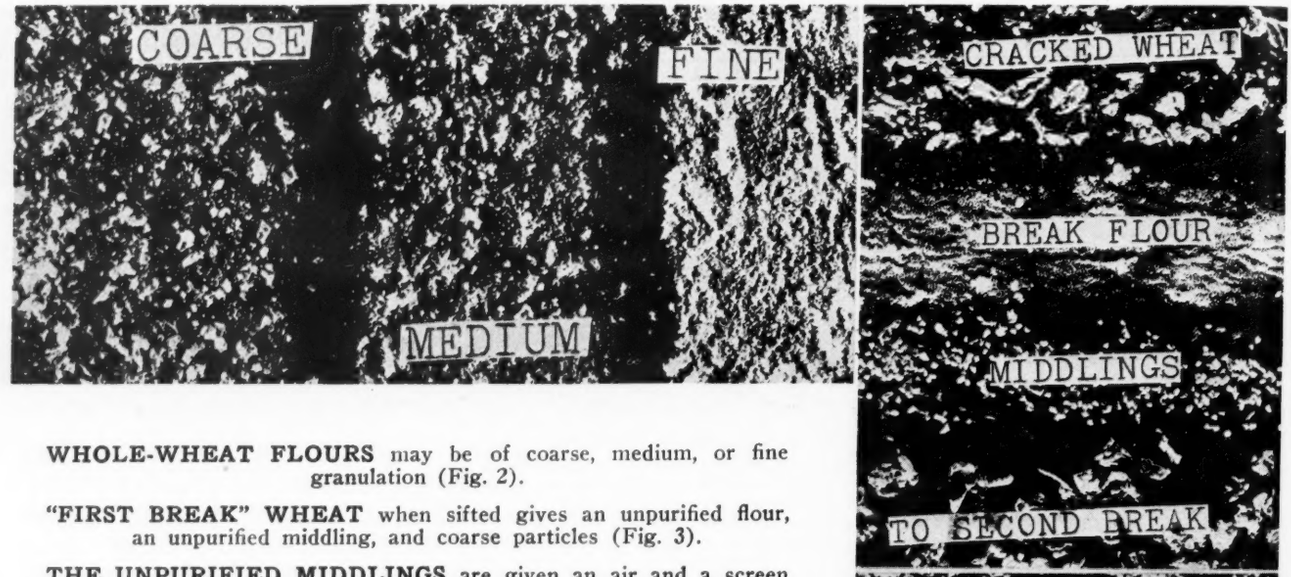
With hard and soft wheat, flour is the goal; so the purified middlings in the center of Fig. 4 are fed to smooth reduction rolls. Reduction is *Step 4* in the milling process. These reduction rolls pulverize the endosperm to a floury consistency, flatten out the oily germ, and make possible further separation of bran material. These reduction processes are repeated on all the purified middlings. In a mill there are seven to nine reduction rolls.

After reduction, the flour is sifted or bolted, which gives us *Step 5*. By this time we have 40 to 60 individual streams or kinds of flours as a result of all of the breaks, purifications and reductions. Each one of these streams has a definite analysis and baking characteristic and may be sold as a product for certain specific requirements.

After thorough test and analysis, the streams are combined in varying proportions to give products such as those shown on the right-hand side of Fig. 1 (double line leading from wheat). Blending is *Step 6*.

On the basis of a 196-lb. barrel of flour, 80 per cent, or 156.8 lb., of the choice streams may be combined to form a patent; and 20 per cent, or 39.2 lb., of the more undesirable

(Turn to page 480)



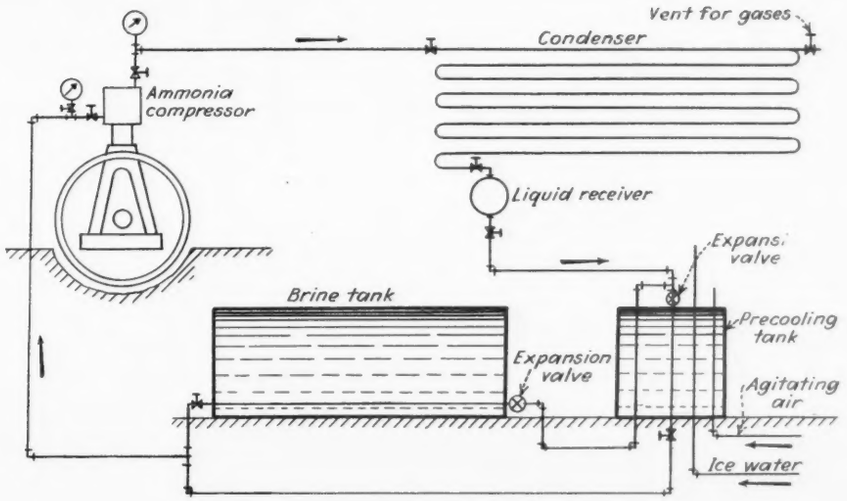
WHOLE-WHEAT FLOURS may be of coarse, medium, or fine granulation (Fig. 2).

"FIRST BREAK" WHEAT when sifted gives an unpurified flour, an unpurified middling, and coarse particles (Fig. 3).

THE UNPURIFIED MIDDLINGS are given an air and a screen separation to get purified middlings and a feed constituent (Fig. 4).

GRANULATED DURUM WHEAT when freed from bran and germ is known as coarse semolina, fine semolina, and flour. Flour usually is an unwanted product (Fig. 5).

Ten Ways to *Reduce* *Refrigeration Costs*



A "double-effect" refrigerating system reduces power cost and increases ice-making capacity of plant

By N. T. PEF
Chicago, Ill.

THERE ARE TRICKS to every trade, and the plant engineer needs a whole bagful to get the most out of a refrigerating system. Here are some helpful pointers:

1. The suction pressure of the compressor should be kept as high as is consistent with operating conditions. The gain obtained from this is indicated by compressor data. A 4-lb. suction pressure, which corresponds to a temperature of —20 deg. F., requires a theoretical horsepower of 1.1 per ton of refrigeration, with ammonia. But with a suction pressure of 16 lb., or a temperature of 0, the required horsepower is 0.8. These figures show that for every increase in the suction pressure, the power cost is lower by 2.5 per cent.

2. Suction pressure is increased by reducting the temperature split, which should be about 15 deg. In ice making, for instance, the temperature of the brine should be 18 deg. F. and the temperature of the ammonia or other medium should be 3 deg. F. (for ammonia this corresponds to 18 lb. pressure).

3. In ice making, the cans should not be filled above the level mark. If the water is above the brine level, a lower temperature will be required for the same freezing effect.

4. For the same reason, the brine should be kept at the proper level.

5. The agitation air in ice making should be cut down to minimum and its temperature reduced to at least its original level. If there are no other means to cool the air, the air line should be run against some cool surface for several lengths.

6. Considerable reduction in power cost and increase in capacity can be realized if the "double effect" is used. This means that the ammonia or other medium coming from the liquid receiver is precooled before it is expanded. The precooling tank is shown on the right of the diagram. A portion of the ammonia is expanded and it cools the remainder of the ammonia. The water for making the ice and the agitation air also can be cooled in this tank. Great savings are possible through this method, as is evidenced from the following (not verified) results by Voorhees, "Mark's Handbook," 1928 edition, page 1,837.

Temperature of condensing water (deg. F.)	100	80	60
Increase in ice making capacity (per cent)	80	58	38
Decrease in horsepower per ton (per cent)	35	22	17

The double effect can be added to an existing plant at little cost.

7. Ice should be harvested at regular periods and frozen cans should not be allowed to remain in the brine. This is another way of increasing the suction pressure.

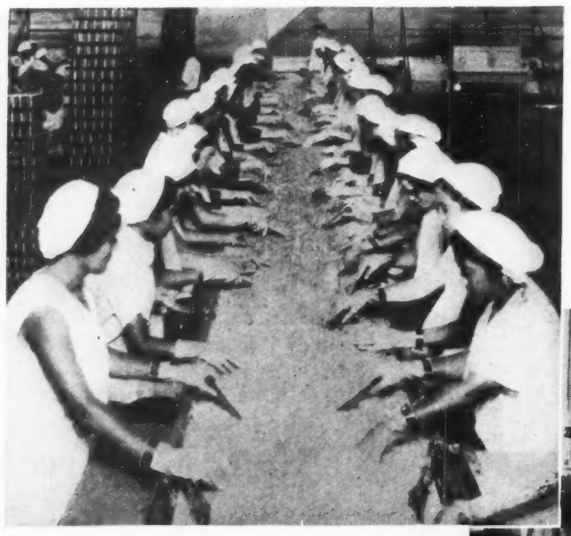
8. In one plant, where the author was the engineer, the electric bill was cut $75 per month by shutting down the ammonia compressor during the noon half hour. This plant had its peak demand during this period, and by shutting down the compressor, the demand charge was reduced considerably.

9. Incorrect indications of the gages (as when the pressure-temperature relation is out of line) shows that there are permanent gases in the system. These should be removed by drawing them from the top of the condenser coil, making the condenser as cool as possible by an excess of cooling water and by stopping the flow of ammonia to the condenser for the time being.

10. Once a year the condenser should be taken off the line and thoroughly blown with steam to remove any accumulation of oil.

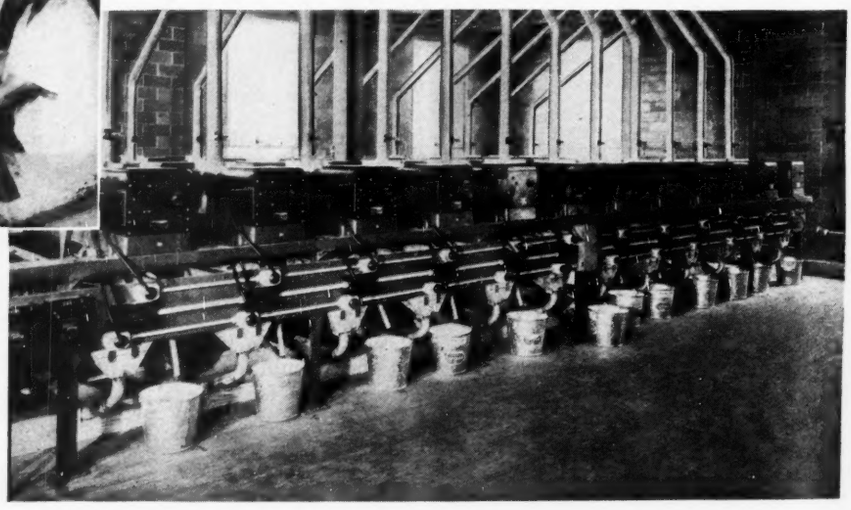
"Electric Eye" Sorting GIVES *Uniform Grading* AT *Low Cost*

By **ROBERT G. SILBAR**
Grand Rapids, Mich.



HAND SORTING, even when done under the best conditions, gives only an approximate grading and at high cost. The average human eye responds quickly only to wide variations in color and other physical characteristics.

IN "ELECTRIC-EYE" sorting a photo-electric cell measures light reflections accurately and controls devices which cast aside that which absorbs more light than an adopted standard.



CLEANING and grading of raw materials as a step in food processing is often a laborious and sometimes an expensive operation. In the case of such commodities as peanuts, dried beans, coffee and the like, final grading is generally accomplished by having girls stationed along both sides of a conveyor belt to pick off objectionable objects as the materials pass by them. Even by this method, used under the most favorable working conditions, it is not always possible to get the desired results.

In an attempt to get uniform quality in the sorting of white pea beans, the General Bean Co., Lowell, Mich., has resorted to a sorting machine manufactered by the Electric Sorting Machine Co., Grand Rapids, Mich., in which photo-electric cells are employed. For more than a year the General Bean Co. has had a battery of 100 of these machines in operation and is well pleased with the results obtained.

They operate on the principle that bad beans and foreign matter are colored, and as the machine operates with precision it sorts out beans so slightly colored that they are hardly noticeable to the human eye. This is accomplished by having individual beans brought before a photo-electric cell in such a manner that a trigger-like device knocks into discard any dark or spotted object, permitting only white beans to pass.

The machine consists of a narrow vacuum drum with a series of small holes in the rim. As the drum sweeps through a hopper of beans a vacuum from inside the hollow drum sucks a single bean tightly against one of the hole openings.

The rotating drum carries the beans into a lamp housing where a group of small electric lights illuminates each bean. The photo-electric cell measures accurately the light reflected by the bean as it passes by, and if the bean is colored, or if a foreign object comes before the photo tube, a distinct change in light intensity results. This intensity is recorded by the photo-electric cell, and the impulse thus set up is amplified by a conventional amplifying circuit until

it reaches a thyratron tube (grid control rectifier). The latter tube permits sufficient current to pass to operate an electro-magnet with a trigger-like hammer on one end. Cull beans or other undesirable objects are dislodged from the vacuum drum by the hammer, while good beans (white) are permitted to pass into a hopper, because they do not create a disturbance in the photo tube. Operation of the thyratron tube in connection with a photo-electric cell, eliminating the necessity of a mechanical relay, is said to have been accomplished for the first time with the bean-sorting device.

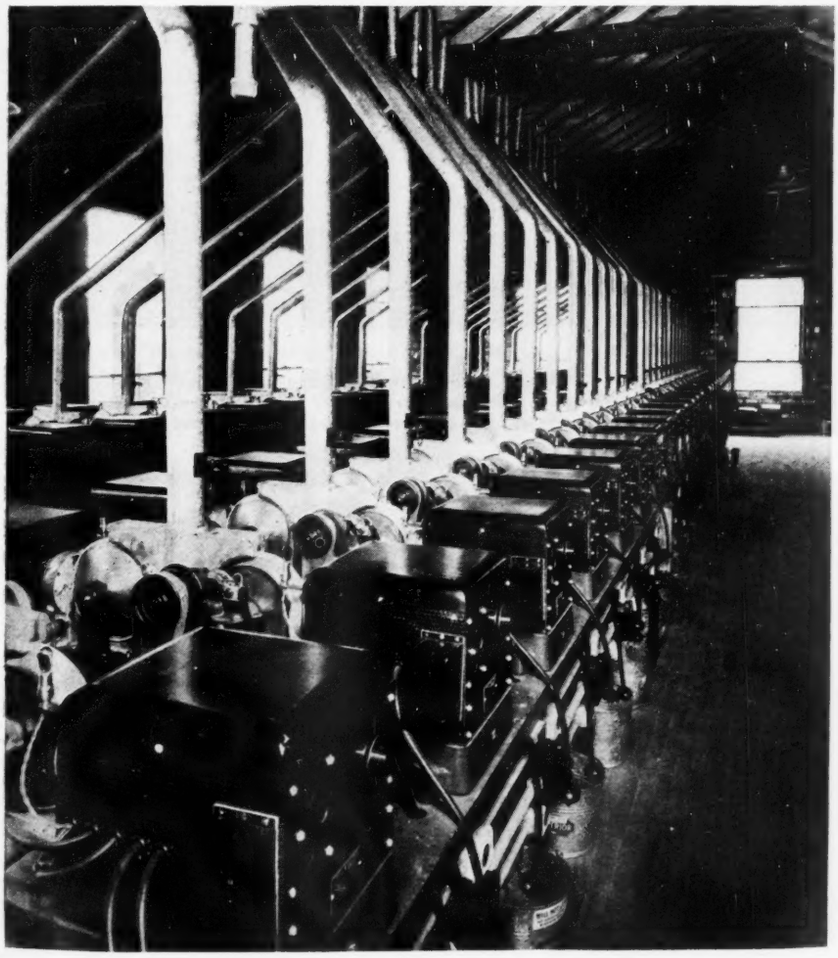
The entire operation takes only a fraction of a second to complete. With a battery of 100 machines the plant now in operation has a capacity of 50,000 lb. of beans a day. Among the advantages of the sorting machine is that it maintains the same gross plant production regardless of whether the beans pick 2 per cent or 25 per cent culls. Elsewhere beans are sorted largely by hand, with the speed of production contingent upon the percentage of colored beans present. This means that, under the hand-sorting methods now in use, it would take five times as long to sort beans picking 25 per cent culls as it would to sort a lot picking 5 per cent culls. With the new equipment the gross production is unaffected by the percentage of culls, the machine maintaining the same rate of speed whether culls run 5 or 25 per cent.

Due to the human element of error, the best possible grade of beans now contains in c.h.p. (choice hand picked) pea beans, 1½ lb. of cull beans to each 100 lb. It is possible with the photo-electric equipment to bring the cull content down to less than one per cent, and at the same time assure uniform quality, with no stones, dirt or badly colored beans. Necessity for bean canners and packers to "repick" beans may eventually be eliminated by this type of sorting machine.

Just before beans are delivered to bagging bins they undergo an inspection by girls seated on each side of conveyors carrying the beans from the machines. This inspection enables them to pick out any spotted or colored beans the machine might have failed to eliminate. At present the only imperfect beans accepted by the machine are those with a spot so small as to be on the side of the bean which does not face the electric eye as the bean passes it.

Each sorting machine is about the size of a small radio set, which it resembles. When the machines are in operation little lamps wink on and off whenever a bad bean is kicked away as it passes in front of the electric eye. If the light stays on, operators cut that individual machine from the line of operation until it can be inspected.

ELECTRIC-EYE UNITS for grading white pea beans in the plant of General Bean Co., Lowell, Mich., are not much larger than table-size radio sets. A hundred of these units grade 50,000 lb. of beans per day.



Meets Exacting Demands

The equipment has been so designed that the product can be sorted to meet the most exacting requirements. A dial controls the sensitivity of the amplifiers so as to permit slightly colored beans to pass by undisturbed, if a cheaper product is desired, while selectivity can be built up until no shades except those approaching pure white will be accepted.

The sorter was conceived by Hugo B. Hammerslag and Lewis W. Tinkham, Grand Rapids bean jobbers, in 1928. Approximately four years was required to perfect it. Martin C. Hansen, electrical engineer, undertook the development work, and later David Clarke Cox made improvements and refinements. Assistance was given also by the General Electric Co., which supplied amplifier units and tested the device thoroughly in its laboratories. A $230,000 company was formed to back the machine, and the General Bean Co. was organized as an operating subsidiary unit to merchandise beans thus sorted. C. H. Runciman, president of the National Bean Dealers' Association and past president of the Michigan Bean Jobbers' Association, has been active in developing the plant.

With minor adjustments, the engineers declare, the machine can be adapted to sort peanuts, coffee, almonds and other foods in which color is a factor in determining selection. At present it is adapted to the sorting of white beans only, but can be equipped with a slightly different circuit to sort red kidney beans, green peas and other food crops, besides manufactured products whose selection depends on color.

Storing EGGS in Belgium *In Inert Gas Under Refrigeration*

After eight months' storage they are still like fresh eggs

By W. POHLMANN
Die Kaelte Industrie
Altona, Germany

TRANSLATED BY
W. M. ZAROTSCHENZEFF
American "Z" Corporation
New York, N. Y

THE problem of preserving eggs in good condition is very delicate, because of the biological and physiological changes occurring in the eggs during ordinary refrigeration. It is the aim of each method of preserving eggs to reduce these changes to a minimum. Of the various methods of egg preservation, such as cold storage, freezing of liquid eggs, immersion in special conserving materials, and preservation in gas, the last named shows much promise of successful commercial exploitation because it does reduce the changes in the egg to a minimum.

The egg itself, as soon as it is laid, is attacked by bacteria and various spores of molds which penetrate the shell and find inside a fertile field for propagation. To check decomposition from bacterial causes, low temperatures are resorted to; however, eggs in shells cannot be kept at a freezing temperature, because the eggs in freezing expand and break the shells. Therefore, the temperature permissible for the preservation of eggs is about 32 deg. F.

But at this temperature molds multiply, especially if the relative humidity is high. Should the egg be preserved in a dry atmosphere, it will evaporate and lose weight, which means a commercial loss. Maintenance of even temperatures and of a suitable relative humidity around 80 per cent is most important.

When using the Lescarde-Everaert method of gas preservation, nearly all these difficulties are avoided. To obtain best results, it is essential that fresh eggs be carefully sorted, tested and packed in paper containers. Of course, dirty or cracked eggs or those of second quality should be rejected. The egg substance is subjected to another attack from within—the chemical processes causing changes in the white and the yolk. The white of the egg undergoes chemical changes which cause it during the time of storage to show an acid reaction, while the white of the fresh egg shows an alkaline one. Eggs stored with insufficient refrigeration will develop ammonia, so that, within a rather short time, the egg will not be suitable for boiling purposes and can be used only for baking. Eggs kept in properly refrigerated storage develop an equal accumulation of ammonia only after eight months.

Such chemical changes in the egg substance are reduced to a minimum if the eggs are stored in an inert protective gas atmosphere, because the oxygen of the air which penetrates the porous shell of the egg causes more rapid chemical changes than does the gas of an inert atmosphere. That is why eggs preserved in gas may, when boiled—even after storage of eight or more months—show no difference in quality from the regular fresh eggs. In fact, gas-preserved eggs will keep much longer in good condition when removed from the gas, because the chemical changes have been retarded.

The bio-physical changes in eggs consist substantially in weight losses caused by evaporation of the egg contents and by the displacement of the egg yolk inside the shell. This condition occurs only when the eggs are exposed to the ordinary atmosphere at a temperature of about 70

Fig. 1—Note the large manometer connected with each sealed chamber to indicate the gas pressure inside. An easily read thermometer on the same support registers the temperature of the room.

deg. F., thus forming a difference in densities between the white and the yolk of the egg. The loss in weight amounts to about three per cent during the first eight months. It is still greater if the eggs are stored in dry air. When eggs are placed in gas, however, the shell remains unchanged, and no loss in weight can be observed even after an eight-months storage period.

The Ste. Ame Courtraisienne d'Alimentation in Courtrai and Ostende owns the largest installations built according to the Lescarde-Everaert system, and stores as many as 30,000,000 eggs at one time.

In the Courtrai plant the boxes of eggs are unloaded in a hall 75x45 ft., whence they are taken to the floor above to be sorted. Women stationed along the four moving belts sort the eggs and pack them in wood cases lined with paraffined cardboard and holding 100 eggs each. Dirty or damaged eggs are immediately sold on the market. The sorting is done by weight; the average egg weighs about 58 to 60 grams.

The eggs are then taken into the testing rooms, where skilled women examine them for traces of molds, blood or too much air. The cases containing perfect eggs are marked and given lot numbers, and are then ready to be placed in sealed chambers for storage. There are 41 of these chambers in the Courtrai building, with capacities from 250,000 to 1,000,000 eggs. They are located in well-insulated rooms refrigerated by means of direct-expansion coils. A chamber holding a million eggs consists of a cylindrical tank in a horizontal position with a diameter of about 9 ft. and a length of about 50 ft. The inner part is galvanized. Airtight doors close both ends.

In a short time after the charged receptacle is sealed, a vacuum is produced and the connection is made for the introduction of the accurately analyzed gas mixture. During storage an excessive pressure of 30 cm. is maintained to prevent any penetration of air from without. The temperature of the storage room is kept at 34 deg. F. According to the patented method of P. Everaert, a natural circulation of the gas inside the autoclave is effected by placing a cooling coil along the outside of the chamber. Condensation of moisture takes place at the coolest point on the side walls, and runs to the lowest level of the chamber without dropping on the eggs. A drop of water in the CO_2 atmosphere is objectionable, as it makes the egg shell coarse and covers it with a white sediment that is visible especially on brown eggs.

Great care is necessary also when eggs are removed from the chamber and brought to other rooms for packing. They must first be taken to defrosting rooms, where properly mixed warm and cold air is circulated in the room, to adjust the eggs to the temperature of the air outside.

In England and Denmark attempts have been made to eliminate the large sealed chambers. In England, galvanized steel plate containers of eggs are put into a small compartment from which as much air as possible is exhausted before it is filled with gas and sealed. These containers are then stored in ordinary cold storage at from 32 to 34 deg. F. In Denmark, special single cabinets of steel plates are built into the insulated cold storages. The eggs are packed in boxes and subjected in a small sealed receptacle first to a vacuum, and afterward, for about fifteen minutes, to a gas mixture, to effect entire penetration of the gas into the eggs. Now the boxes are shifted into the steel cabinets, and the doors are sealed. A vacuum pump fitted on the top sucks the air out of the cabinets while a gas mixture is being let in at the bottom. Thus, the steel cabinets are not subjected to any pressure from the surrounding air. In the space between the steel cabinet and the wall of the cold storage the channels for air cooling are arranged, by means of which the inside temperature of the steel cabinets is held at 34 deg. F.

In the English method, the large number of steel cabinets means an increase in labor in handling and that the steel cabinets may become slightly unjoined or bent while being installed or transported. The Danish method involves loss of space, an increase in labor in the preliminary treatment of the eggs, and the risk that after the eggs have been penetrated by the gaseous mixture they may fail to keep preserved because of their journey through ordinary air to the steel cabinets, which, themselves, do not necessarily contain an oxygen-free gas-protective atmosphere.

Since only fresh-laid eggs are suitable for the Lescarde-Everaert method of preservation, there must be a large quantity of eggs available where the method is employed. Furthermore, investment and overhead expenses must be spread over a sufficient number of eggs. Although costs are slightly above those of ordinary storage, the increase in expense of the method is offset by the better market price commanded by the gas-preserved egg.

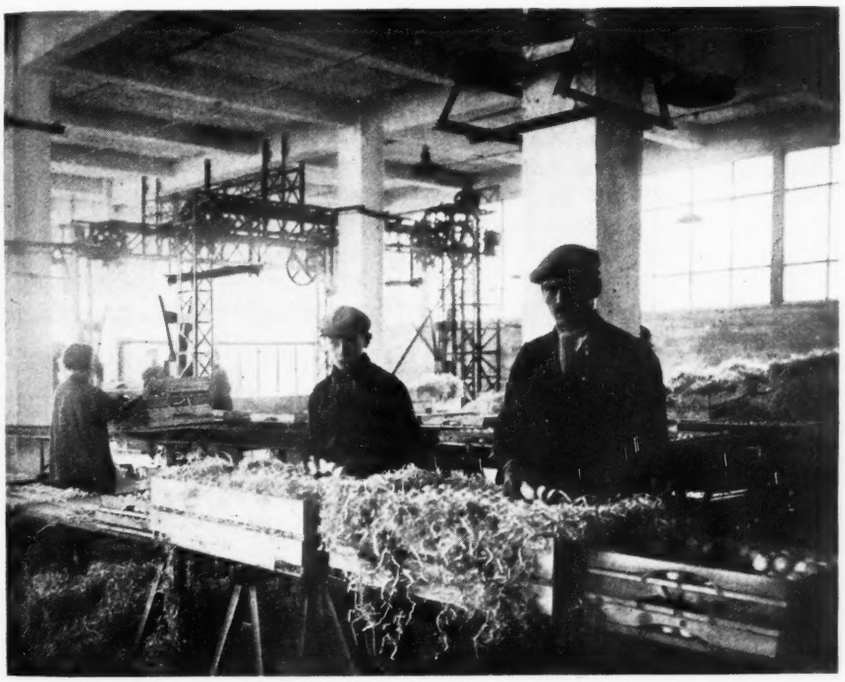


Fig. 2—Only unbroken fresh eggs which have been sorted and graded according to cleanliness, weight, and freedom from molds, blood clots and excess air are stored.

How CODES Affect *Truck Purchases*

MANY fleet owners in the food field who have for years purchased trucks, passenger cars, parts and accessories at quantity discounts have been puzzled as to whether they could continue to do so when the marketing rules of the Code of Fair Competition for the Motor Vehicle Retailing Trade goes into effect. That code was signed by the President and became effective as to wages, hours and labor on Oct. 3, 1933. The trade regulations, marketing rules and used-car allowance provisions of the code became effective 30 days later, or on Nov. 3, 1933.

The marketing rules of the code state:

"No dealer shall sell a new car or commercial vehicle (with body of ¾-ton capacity or less) for less than the factory list price, plus an amount equal to (*a*) Equipment at listed prices; (*b*) All taxes paid by the dealer applicable to the motor vehicle sold; (*c*) Average cost of transportation from factory of said dealer; (*d*) Dealers' actual cost of handling such items as unloading, assembling, conditioning for delivery and interest actually paid by said dealer."

Sec. 7, Art. 4, of the code further states:

"The retail list price for parts, accessories and supplies will be the manufacturers' published list price adjusted to include all taxes. It shall be an unfair trade practice for any dealer to sell such parts, accessories and supplies at other than retail list price except to duly authorized dealers, associate or sub-dealers or established service stations, operating under any N.R.A. code."

Fleet Discounts Still Exist

While, under the above code, retail automobile dealer distributors or factory dealers cannot sell any passenger or commercial vehicle to fleet buyers at a discount after Nov. 3, 1933, unless such vehicle is rated over ¾-ton capacity, the Motor Truck Association of America, with headquarters at 1440 Broadway, New York, N. Y., is authority for the interpretation as this is written, on Oct. 19, 1933, that "there is nothing in any code so far approved that prevents commercial vehicle operators from purchasing cars or trucks of any size or capacity from car or truck manufacturers at fleet discounts." Furthermore, that "Commercial vehicle operators who maintain their own established service facilities can continue to purchase parts, accessories and supplies at fleet discounts either from retail dealers or factory sources." And furthermore, that "There is nothing in the National Automobile Chamber of Commerce (car and truck manufacturers), the A.P.E.M. (parts and accessory manufacturers) or the M.E.W.A. (motor equipment wholesalers) codes that prevents the fleet buyer from purchasing cars, trucks, parts, equipment or supplies at discounts in accordance with established practice."

It is understood that a separate code covering the sale of commercial vehicles over ¾-ton capacity by dealers, distributors and factory branches is being prepared. Whether or not this proposed code will include any provisions limiting or changing fleet discounts is not known.

Thus, as the situation stands as of Oct. 19, 1933, the fleet owner can obtain quantity discounts as heretofore on all trucks over ¾-ton capacity and on passenger cars and trucks under ¾-ton capacity if purchased from car or truck manufacturers instead of retail dealers. Similar discounts on parts and accessories can be obtained under the code if the fleet owner maintains his own shop classified as an established service station.

N.R.A. Interpretation of Truck Code Purchases

Contrary to some press reports, fleet sales are not subject to N.A.D.A. code, which concerns only sales at retail—statement made by Colonel Lea, Assistant Administrator, N.R.A., Washington, D. C.

Prepare NOW for COLD WEATHER

Motor Truck Operation

NOW is the time for the fleet owner in the food field to get ready for the winter operations of his trucks and passenger cars. Decisions must be made as to the kind of anti-freeze solutions which will be used; the kind of radiator or hood covers, if any; the S.A.E. numbers of less viscous engine oils and chassis greases and the kind of anti-skid devices. Stocks of all cold-weather supplies and equipment should be secured and distributed well in advance to the points at which they will be used, so that they will be available if required on short notice.

There is still a wide divergence of opinion as to the relative merits of alcohol, glycerin and chemically prepared anti-freeze solutions. However, practically all fleet owners are agreed as to the necessity of using some anti-freeze, not only to prevent frozen cylinder blocks but as an aid to operating economy.

A motor which is idled consumes fuel which must be included in the cost of winter operation. If truck engines can be run in cold weather at normal operating temperatures, crankcase dilution and attendant evils may be lessened and gasoline and oil consumption kept fairly constant.

Whatever anti-freeze is selected, it should be distributed in proper quantities to the points at which it will be used and proper instructions given as to when and how it should be put into the engine cooling systems. Hydrometers should also be furnished to determine the specific gravity of the anti-freeze and water solution. These gravities should be checked frequently, especially with alcohol.

Before any anti-freeze solution is added to the cooling system, all joints in the latter should be gone over thoroughly by the mechanic. This is necessary to prevent leaks such as might occur at the radiator hose connections, the water pump packing glands and even the cylinder head gaskets.

What the *Proposed Food Law* Really Means to FOOD MANUFACTURERS

The Copeland Bill, S. 1944, does the following things of which most food manufacturers are unaware:

1. Dictatorial powers are conferred upon the Secretary of Agriculture.

2. Puts advertising and promotional literature as well as labeling under the control of the Secretary.

3. Deprives manufacturers of the right to appeal to courts for relief from decisions on food standards.

4. Requires label to show all ingredients of food specialties in order of predominance by weight.

5. Compels approximate publication of formulas through effect of No. 4.

6. Requires statement of grade on the label, even though it may be impractical.

7. Confers drastic powers of inspecting plants and copying records, subject to heavy penalties.

8. Compels manufacturers to divulge all methods and materials used.

9. Permits seizure of goods without court order.

10. Establishes bureaucratic control of food industry.

11. Orders Secretary to publish information regarding foods to protect consumer against fraud.

12. Establishes a system of voluntary inspection service at expense of manufacturers under conditions which will practically compel them to accept it.

In spite of all this there is much of merit in the bill. Many manufacturers believe there should be progress in food regulation. The question each manufacturer must decide for himself is whether he wants the benefits under the conditions imposed. If not, then act individually and through trade association representations.

THE FOOD AND DRUGS ACT—OLD AND NEW—*A Detailed Comparison*

Senate Bill 1944	Present Law
Sec. 1. Title	
Sec. 2. Definitions of food, drug, cosmetic, advertisement, and other terms used in bill.	Definition of drug does not include therapeutic devices, or drugs or devices intended to affect non-pathologic conditions of the body. Cosmetic and advertisement not defined.

SEC. 2 (a) Does not exempt from food the medicated foods which many believe should be classed under drugs because of medicinal or therapeutic claims. All printed matter accompanying any food or any form of advertising comes under the jurisdiction of the law.

Adulteration of Food

Sec. 3 (a) Food defined as adulterated if dangerous to health; if added poisonous substances present in excess of tolerances prescribed by Secretary; if filthy or decomposed; if prepared under unsanitary conditions; if from diseased animals; or if packed in poisonous containers.	No provision against packing under unsanitary conditions, or in poisonous containers. No authorization to establish tolerances for poisons. Other provisions essentially the same.
(b) Food adulterated if valuable constituent removed; if another substance substituted partly or entirely for the article; if damage or inferiority is concealed; or if any substance has been mixed with it to increase its bulk or weight or to reduce its quality or to create a deceptive appearance.	Contains essentially the same provisions.
(c) Confectionery defined as adulterated if it contains alcohol, resinous glazes, or non-nutritive substances.	Resinous glazes not prohibited and only certain enumerated non-nutritive substances banned. Otherwise essentially similar.
(d) Prohibits use of uncertified coal-tar colors in foods.	No similar provision. No action can be taken unless it can be proved that colors or their impurities are poisonous and that they are present in such quantities as may be harmful to health.

UNDER the old law, food was adulterated if it contained any poisonous or deleterious ingredients injurious to health. Under the proposed law a food is adulterated if it contains any such ingredient in excess of tolerances prescribed by the Secretary. Under the old law, a food was adulterated if any substance had been mixed with it so as to reduce or injuriously affect its quality. However, under the proposed law a food is adulterated if any substance has been mixed with it so as to increase its bulk, or weight, reduce its quality, or create a deceptive appearance.

Sec. 3 (a) (4) is of particular significance to operating men, for a food may be declared adulterated "if it has been prepared, packed or held under unsanitary conditions whereby it may have become contaminated with filth." Note that it is not necessary to prove that it was actually contaminated. It is only necessary to show that the food is produced where it *may* have become contaminated. It is not necessary for the contamination actually to occur. If it *could* occur, the food is adulterated under the meaning of this section. Plainly the clause as written is an absurdity and unworkable.

Sec. 3 (b) (1) "If any valuable constituent has been in whole or in part abstracted therefrom" the food is adulterated. This needs clarification and interpretation. As now

written, the new law, in the hands of a food faddist, could be interpreted to declare as adulterated a patent flour because the exterior portions of the wheat berry were removed in the milling process.

Sec. 3 (b) (4) "If any substance has been mixed or packed therewith so as to increase its bulk or weight, or reduce its quality or strength, or create a deceptive appearance" also needs revision. It states that if the mere effect is to increase bulk or weight, etc., regardless of whether the *purpose* is to effect such an increase, the food is adulterated. Failure to foresee an erroneous impression which may be created will be no defense for a luckless manufacturer. Where does ice cream, mayonnaise or salad dressing come under such a rule? What about anti-caking substances in salt or sugar?

Sec. 3 (b) will declare as adulterated cordial candies because they contain alcohol.

SENATE BILL 1944	PRESENT LAW
SEC. 4 (a) Adulteration of drugs (omitted).	
SEC. 5 (a) Adulteration of cosmetics (omitted).	

Misbranding—General

SEC. 6 (a) Food, drugs and cosmetics defined as misbranded if labeling is false or misleading in any particular.	No provisions on cosmetics. Otherwise essentially the same.
(b) Food, drugs and cosmetics in package form must bear labels which show the name and address of the manufacturer or distributor and the quantity of the contents. Canned food which moves in substantial quantities from packing to labeling establishments, there to be labeled, is exempted from penalties if it is actually labeled properly before leaving the labeling establishment.	Neither food nor drugs required to be labeled with the name and address of manufacturer or distributor. No provision on cosmetics. While statement of quantity of contents is required on food, no such requirement of contents for drugs. No provision specifically exempting canned food from labeling to show quantity of contents, but by order of Secretary such exemption administratively allowed.
(c) All statements required by this and other sections of the act must be plainly and conspicuously set forth in terms readily intelligible to the consumer.	Specifically required only for statements of quantity of contents; otherwise required only by inference.

SEC. 6 (a) contains the phrase "If . . . by ambiguity or inference creates a misleading impression regarding any food," which is a phrase most unusual in a criminal statute and is an invitation for lawsuits. In fact, it is a "natural" for lawyers.

Sec. 6 (c) will require all the labeling information to be placed on the front panel of a label in such a manner as to be easily seen under the customary conditions of purchase and use.

Misbranding of Foods

SEC. 7 (a) Food misbranded if in deceptive or slack-filled containers.	No similar provision.
(b) Food misbranded if offered for sale under name of another food.	Contains same provision.
(c) Food misbranded if imitation and not so labeled.	Contains essentially same provision.
(d) Food misbranded if it fails to meet the definition of identity legally promulgated by regulations, or if its label fails to bear the name of the article.	Definitions now promulgated have no legal effect, but must be supported by expert testimony. Name of food defined not required to appear on label.
(e) Food misbranded if standards of quality have been legally promulgated and its label fails to state the quality of the food.	A similar provision is applicable only to canned foods.
(f) Food misbranded if it is represented as one for which no definition has been prescribed and its label fails to bear the name of the food and of each ingredient in the order of predominance by weight. Secretary authorized to require by regulation such further information on the label as may be necessary to prevent deception.	No provision for informative labeling. On the contrary, food sold under a distinctive name which does not imitate the distinctive name of another article is exempted from provisions against adulteration and misbranding if it does not contain added poisonous ingredients. Exemptions also made for articles sold as compounds and blends. Extent of these exemptions not fully clarified by court decisions.

SEC. 7 (e) is highly impractical for canned foods, particularly when it is considered in connection with Sec. 11. Some canners regard it as "iniquitous." And, unfortunately, political considerations may enter into the establishment of definitions of standards of quality; if past experience is any criterion. Thus a federal definition of fancy canned peas conforming to the prevailing Wisconsin or Minnesota idea of that grade would exclude from the fancy grade of quality the Delaware idea of fancy quality, and it is too much to expect of human nature to believe that residents of Delaware would submit without an effective protest. The net result to be anticipated is a lowering of definitions of quality in response to political pressure, and, of course, this will not satisfy the industry in states more favorably located.

Sec. 7 (f) will fall heavily on manufacturers of specialty foods for which no definition of identity has been prescribed by regulations. In the case of relishes, spreads, pastes such as guava paste, Worcestershire sauce, A-1 sauce, gravy flavorings such as kitchen bouquet, canned soups, canned spaghetti, canned pork and beans, Puffles, self-rising flours, cereal preparations such as Grapenuts, Corn Flakes and the like, certain carbonated beverages, prepared desserts and most food specialties for which there are no regulatory definitions, each ingredient must be declared on the label in the order of predominance by weight, except that spices, flavors and colors need not be named specifically. This provision will result in practical disclosure of many formulas and, when considered in connection with Sec. 13 and Sec. 22, will preclude withholding many secrets.

SEC. 8 (a) Misbranding of drugs (omitted).	

False Advertising

SEC. 9 (a) and (b) Advertising of food, drugs and cosmetics defined as false if misleading in any particular.	Contains no such provision.
(c) Public advertising of drugs for diseases wherein self-medication may be dangerous prohibited.	Contains no such provision.

See comment on Sec. 6 (a).

Tolerances for Poisonous Ingredients in Food and Cosmetics and Certification of Coal-Tar Colors

SEC. 10. Secretary authorized to prohibit added poisons in food and cosmetics, or prescribe tolerances for them.	No provision on cosmetics. Expert testimony must be brought in each contested case on food to show beyond reasonable doubt that the poison is present in such quantity as may be harmful to health.

Definitions and Standards for Foods

SEC. 11. Secretary authorized to establish definitions of identity and standards of quality and fill of container for food.	Law authorizes establishment of standards of quality and fill of container for canned food only. Present definitions and standards for other food do not have the force and effect of law, and

Senate Bill 1944	Present Law
	in all cases expert testimony must be introduced to sustain their validity.

Sec. 11. The Secretary's decision is final. There is no appeal to the courts.

Permit Factories

Senate Bill 1944	Present Law
Sec. 12. Secretary authorized to require permits for interstate shipment of classes of food, drugs and cosmetics which by reason of conditions surrounding their manufacture may be injurious to health, and where their injurious nature cannot be adequately determined after interstate shipment.	Contains no such provision.

SEC. 12. Under the old law, the U. S. Supreme Court declared the Secretary of Agriculture had nothing whatever to do with reference to the manufacture of foods. Under the proposed law the Secretary makes such regulations governing the conditions of manufacture, processing, and packing as he deems necessary to protect public health, and requires manufacturers to hold a permit conditioned on compliance with such regulations. The Secretary is authorized to issue permits for such periods as he may prescribe and may suspend immediately upon notice any permit if he finds that the conditions of the permit have been violated. This probably will be another effective way to force manufacturers to take the voluntary inspection service under Sec. 22 as a means of avoiding an unexpected loss of the right to operate.

Factory Inspection

Senate Bill 1944	Present Law
Sec. 13. Inspectors authorized to make inspection of factories, warehouses, and other establishments in which food, drugs or cosmetics are manufactured or held. Provision made to enjoin interstate shipments from factories or warehouses refusing privilege of inspection.	Contains no such provision.

UNDER SEC. 13 (a) an easy way is afforded to any manufacturer to stop his business suddenly by an inadvertent refusal of admission to an inspector. Under the old law a manufacturer could exclude an inspector if he so chose (which was always an unwise procedure), but under the proposed law the inspector himself can put such a manufacturer temporarily out of interstate business by securing an injunction from the district court if inspection is refused.

The question now is, what is an inspector? Sec. 15 indicates that not only are employees of the food and drug administration to be considered as inspectors but also any health, food or drug officer of any state, territory or municipality may be duly commissioned as an inspector. The integrity of specially commissioned temporary inspectors may be questionable from the viewpoint of a manufacturer who may not care to reveal to the casual inspector all the results of his researches.

Records of Interstate Shipments

Senate Bill 1944	Present Law
Sec. 14. Interstate carriers of food, drugs and cosmetics, and interstate consignees of such articles, required to permit inspectors to copy records showing interstate shipment.	Contains no such provision.

SEC. 14 affords an amazing invasion of the privacy of commercial transactions. Under this section and Sec. 23, the Secretary of Agriculture, vested with authority of parts of the Interstate Commerce Act, presumably will have authority at all reasonable times to examine and copy any documentary evidence of any corporation being investigated or proceeded against, and subpoena witnesses for the production of documentary evidence, and compel witnesses to appear and testify before the Secretary, subject to a penalty of not less than $1,000 nor more than $5,000. Any corporation that makes a false entry or memorandum, or that fails to make direct entries or memoranda of all facts and transactions appertaining to the corporation, shall be subject to a fine of not less than $1,000 nor more than $5,000, or if the corporation fails to file an annual or special report at the time fixed, shall forfeit to the U. S. Government a sum of $100 for each and every day of delay.

Investigations and Institutions of Proceedings

Senate Bill 1944	Present Law
Sec. 15. Authorizes the department to investigate food, drugs and cosmetics, through its own agents or through state or city officials. Prescribes duties of U. S. Attorneys to whom violations of the act are reported. Requires Secretary to give opportunity for hearing before criminal prosecution.	Hearing is not required except in prosecutions against dealers who have received and distributed goods in violation of the act. Nevertheless, the administrative practice has always been to afford hearings to prospective defendants. Other provisions essentially the same.

Seizure

Senate Bill 1944	Present Law
Sec. 16. Authorizes seizure of articles in violation of the law by process pursuant to libel, or in cases where there is probable cause to believe that articles are adulterated so as to be imminently dangerous to health, upon the order of an officer of the department, after which jurisdiction of the court attaches. Where recovery is had in a suit against an officer by reason of seizure on probable cause, judgment will be paid out of appropriations for the administration of this act. Courts authorized to dispose of articles condemned after seizure, by destruction or sale. Proviso made that seized goods may be returned to the claimant under bond for destruction or for bringing them into compliance with the law, if this can be done.	Contains no provision for executive seizure, even though product imminently dangerous to health. Other provisions essentially the same.

UNDER the old law, foods could be seized only by court order. Under the new law, foods may be seized by an officer of the Food and Drug Administration. Under the old law, whenever any food was seized, the release of it could be demanded on the tender of a bond conditioned that the food would not be disposed of contrary to law. Under the proposed law, foods can be released only after entry of a decree and the tender of a bond conditioned that the food will not be disposed of other than under the supervision of an officer or employee designated by the Secretary. If the article has been manufactured by a manufacturer not holding a valid permit, then the food shall be destroyed without right of reconditioning.

Penalties

Senate Bill 1944	Present Law
Sec. 17. Provides penalties of imprisonment and fine for both first and subsequent violations of act; repeated offenders and wilful offenders subjected to heavy penalties. Exempts publishers and radio broadcasters and advertising agencies from penalties if they furnish name of person responsible for the advertising. Exempts dealers from prosecution who hold guarantees. Pro-	Penalties are very small, and imprisonment authorized only on second offenses. No special penalty provided for wilful violation. Contains no penalties for false advertising. Contains same exemption for dealers.

Senate Bill 1944	Present Law
hibits forging of label identification devices authorized by regulations under Secs. 12 and 22.	

SUB-SEC. (b) of Sec. 17 is particularly vicious, as it affects publishers, advertising agencies or radio broadcasting licensees. As the proposed law is written, it does not exempt them from penalties if they furnish the names and addresses of the persons responsible for advertising. It merely authorizes the Secretary to exempt any such person if he chooses to do so by requesting through an officer or duly designated employee such information (which the Department of Agriculture ordinarily possesses). It does not provide that the person shall *not* be prosecuted criminally if he furnishes the information or *unless* he withholds it. As it is written, the Secretary must actually issue a request for the information or the person is criminally liable regardless of whether he gives the information or not. The wording of this sub-section is perhaps an unintentional example of creating a misleading impression, the very thing the Department of Agriculture is opposing, and shows how easy it is to fall into this legal pitfall. It was admitted on Sept. 16, 1933, by Assistant Secretary of Agriculture Tugwell, that this paragraph should be rewritten because it was not the department's intent to be able to prosecute should it elect not to request the name and address of the advertiser.

Liability of Corporate Officers

Sec. 18. Provides for liability of officers of corporations violating the law.	Contains similar provision.

Injunction Proceedings

Sec. 19. To avoid multiplicity of seizure and criminal proceedings, U. S. courts are vested with jurisdiction to restrain repetitious violations by injunction.	Contains no such provision.

Imports

Sec. 20. Lays down procedure for excluding adulterated, misbranded and falsely advertised food, drugs and cosmetics from importation.	No provision on cosmetics. No provision against importation of falsely advertised food and drugs. Otherwise essentially the same.

Publicity

Sec. 21. Secretary authorized to publish all court proceedings and to disseminate such other information regarding food, drugs and cosmetics as may be necessary to protect the public health or to protect the public against fraud.	Authorizes publication of judgments of the court only.

UNDER SEC. 21, sometimes referred to as the "legal blackmail section," the Secretary is the sole judge of what information is to be disseminated and there need be no conviction, hearing or opportunity for defense prior to his act. While no right-thinking manufacturer would be likely to merit the censure that is possible under this section, events of recent memory show how unfair a Secretary may be if he disseminates information based on half truths. In the case of the recent price rise of bread in the State of Iowa, Secretary Wallace was giving publicity to the situation, acting under the provisions of Sec. 9 (e) of the Agricultural Adjustment Act. By his asking publicly for the justification of a price increase the public gained the impression that the bakers were profiteering, which was not the case.

Voluntary Inspection Service

Sec. 22. Secretary authorized upon application of manufacturers to designate supervisory inspectors in factories of food, drugs and cosmetics, who, if the goods conform to the requirements of the act, will permit the use of marks showing compliance with the act and such other information as the regulations may provide. Such services to be paid for by applicant, and proceeds to be turned into the Treasury for use by the Secretary in expenditures incurred in carrying out this section.	Contains no such provision.

MOST manufacturers of specialties, and many others if they can afford the cost, will find it expedient to go into the voluntary inspection service. After a study of the implications of Secs. 12, 13, 15, and 24, it seems probable that they will decide that this is the easiest way out of many problems arising under the proposed law.

General Administrative Provisions

Sec. 23. Secretary authorized to prescribe rules and regulations for carrying out the provisions of the act except those relating to imports. Secretaries of Treasury and Agriculture authorized to preserve regulations covering imports. Secs. 9 and 10 of Federal Trade Commission Act incorporated by reference.	Regulations made by Secretaries of Treasury, Agriculture and Commerce. No provision similar to Secs. 9 and 10 of Federal Trade Commission Act.

Liability for Personal Injuries

Sec. 24. Authorizes suit for personal injuries caused by violation of the act.	Contains no such provision.

"SEC. 24. A right of action for damages shall accrue to any person for injury or death proximately caused by violation of this act." While this apparently is directed toward the drug or cosmetic manufacturers, the food manufacturer also is included. Many may find it expedient to operate under voluntary inspection service in order to have its moral benefits.

This section seemingly plays right into the hands of those sinister individuals who attempt to collect easy money. While the act does not specifically mention foreign substances in foods, it may possibly be construed that they are contemplated in Sec. 3 (b) (2): "If any substance has been substituted wholly or in part therefor."

Separability Clause

Sec. 25. Separability clause.	Contains no such provision.

Effective Date and Repeals

Sec. 26. Effective date and repeals.	

Outstanding Changes

The outstanding changes in the bill from the provisions of the present law are:

1. Extension of jurisdiction to advertising.
2. Inclusion of cosmetics.
3. Authorization to limit added poisons in food to specific tolerances.
4. Authorization to establish definitions and standards for food.
5. Authorization to require permits when food may be injurious and public cannot be effectively protected by other provisions.
6. Provisions to control more adequately false or misleading therapeutic claims on drugs.
7. Requirement for fully informative labeling of food and drugs.
8. More adequate remedial provisions.

Marketing Agreements Approved

NO ACTION ON CODES

Tugwell May Try to Set Up Autocratic Rule Over Food Processors

SEVERAL marketing agreements, but not a single code, forced their way through the A.A.A. during the past month. There is some promise of action in Secretary Wallace's statement that, with agreement on common principles embodied in the master retail code and its companion, the food and grocery code, progress can be expected. But there has been no essential change in the attitude of A.A.A. that its business is to raise the farmers' income and that coding the food industries can wait.

When reminded of the large number of codes pending, Secretary Wallace remarked recently that the industries which had submitted these documents had secured P.R.A. agreements from the N.R.A. He gave the impression that this should satisfy them for some time to come. The industries feel, on the other hand, that in return for raising wages, curtailing hours, employing more men and pledging their cooperation in the program to boost farm prices, the A.A.A. should give them the opportunity held out as a reward by the National Industrial Recovery Act to eliminate unfair trade practices and develop methods of doing business that may partly offset the cost to employers of the recovery drive.

To the food industries, the campaign for curtailing the production of agriculture is entirely acceptable. This is, indeed, one of the stipulations made by Colby M. Chester, chairman of the executive committee, in pledging the Food Industries Advisory Board to use all reasonable efforts in securing active cooperation from industry to restore the purchasing power of farm products to parity.

Tugwell Is Ambitious

But the food industries are disturbed by the disposition to take the profit out of business which seems to be permeating the A.A.A. It first became apparent following contacts with Assistant Secretary Tugwell, with whom industrial executives find it very difficult to cooperate. The resignation of Charles J. Brand as coadministrator was not reassuring, but he was obliged to retire to grapple with pressing problems of the National Fertilizer Association, of which he is executive secretary. The Tugwell faction now is credited with the ambition to set up an autocratic rule over food processors through licensing of their operations.

That such views have a voice in the A.A.A. council chamber obviously is of far greater concern than mere inaction on codes proposed by the food industries for governing their own conduct. There is some reason to believe that no action can be expected until after the evident internal troubles of A.A.A. are exposed. It would not be surprising if the Tugwell group would succeed in routing George Peek from office as administrator. Such back-stage developments may come with dramatic suddenness. In the meantime, the A.A.A. is vigorously pushing forward its curtailment programs in the principal branches of agriculture, and the consideration of marketing agreements and codes has assumed a certain slow-moving routine.

Marketing Agreements

Appointment of Col. Robert Davis, an old army man, as administrative officer of A.A.A. was announced as a step toward coordinating and speeding up the handling of codes and agreements. Marketing agreements concluded during the past month cover walnuts, Northwestern wheat, Northwestern tree fruit, California Tokay grapes, Southern rice, California rice, and milk in Baltimore, Knoxville, New Orleans, Alameda County (California) and Evansville (Indiana). The A.A.A. is hard put to keep the milk licensing system from getting out of hand. Numerous violators in the Philadelphia milkshed are being called to book, and in Chicago, the Pure Milk Association has served notice on A.A.A. that it will ignore the agreement unless independent producers are compelled to raise prices. The controversy centers on the amendment to the Chicago agreement, approved by Secretary Wallace, raising the retail price from 10 cents to 11 cents per quart. Independent producers who refused to subscribe to agreement are maintaining an 8-cent level.

Following the master code on food and grocery distribution to hearing this month were the codes on mayonnaise, peanut shelling, coffee, fishing, and paper-shell pecans. A marketing agreement covering the principal commercial varieties of cheese was submitted by the National Cheese Institute, the National Cheese Producers' Federation and allied interests. No licensing system is proposed, and enforcement of the agreement would be placed in the hands of a control committee composed of five representatives of the National Cooperative Milk Producers' Federation and five representing the corporate interests.

The agreement proposes to levy an assessment, on an equal basis, upon all divisions of the cheese industry. The rate proposed for milk producers is one-twentieth of 1 cent per pound of cheese produced from their milk deliveries. This does not apply to Italian and soft cheeses. For each variety of commercial cheese included in the agreement, there would be a separate market price committee to establish prices according to current supply and demand. The code prohibits objectionable practices in assembling and marketing of American, Swiss, Limburger, brick and Muenster. Rules are prescribed covering the testing of milk, cream and cheese. The agreement is one of a series submitted to A.A.A. by the various branches of the dairy industry. The dry milk and evaporated milk agreements have been approved. Those on butter and ice cream are still in process.

Millers File Code

Wheat flour mill operation would be limited to 144 hours a week under the code filed by the Millers' National Federation. Plants would be excluded entirely that have not been in active operation for three months prior to effective date, and additional capacity would be subject to permit by the Secretary of Agriculture. The code would prohibit destructive price cutting and the sale of straight flour below a minimum cost basis bulk f.o.b. mill, to be determined according to the formula prescribed in the code, with differentials for patent and other grades, flour in bags, and self-rising flour. Any miller, parent or holding company, subsidiary or affiliate whose price policies were questioned by the millers' executive committee would be required to submit any information regarding costs, prices and operations that was requested. The code sets up uniform sales contract provisions and prohibits rebates, premiums, waiver of charges, commercial bribery and guarantee against price decline.

Selling below cost and price fixing are ruled out by a code of fair competition filed with the A.A.A. by National Syrup and Molasses Association. This proposed pact covers the entire syrup and molasses industry, as does a marketing agreement filed at the same time.

FLOUR MILLERS *Fail to Reach Agreement With A.A.A.*

IN THE COMPLEX controversy over price control problems, the flour millers' negotiations with the Agricultural Adjustment Administration have resulted in an impasse which, possibly, only President Roosevelt can break. There are several points of difference between what the millers propose and what the A.A.A. apparently favors. However, so far as known, A.A.A. folk have expressed themselves only as to what they object to in the millers' proposals. The main issue is the contention of the millers that their code should prohibit sales of products at less "than the minimum cost basis f.o.b. mill," to be determined by a formula which would add up to 85 per cent of the weighted average manufacturing, administration and office selling expense to the cost of raw materials. The aim of the proposal is to prevent cutting of prices below processing and raw-material costs. Also there is a dispute with the National Recovery Administration, which has jurisdiction over the wages and working-hour provisions of such codes, as to the time in which working hours may be distributed. The millers propose 90 days. The N.R.A. thinks it should be shorter. There is no state of impasse as to that question, which probably will be easily determinable once the millers get together with the A.A.A. authorities.

The millers have been operating under a P.R.A. arrangement which fixes a 40-hour week, with a 90-days leeway for distribution, and minimum wage rates. It is estimated by the Millers' National Federation that, under the P.R.A. policy, employment in the industry has increased 32½ per cent over what it has been of late and about 22 per cent above the average for 1929. They have not yet made findings as to increase in wages and other costs.

Negotiations for an A.A.A. code began in midsummer, when it was expected that the code would be in effect by early autumn. But "consumers' representatives" in the A.A.A balked at the cost-basis provisions in the tentative code that was presented informally. They seemed afraid that the processing-cost formula would turn out to be a cost-plus arrangement. The A.A.A. as a whole is said to have opposed any price-control provision unless the code was made to embody a trade agreement guaranteeing "parity" prices to farmers for wheat and other farm products used by flour millers. This, the millers contended, was covered by the processing tax collected by them; and they asserted also that a trade agreement guaranteeing prices to be paid by them would be unworkable unless all elements of the grain trade could be included.

The A.A.A. is in a somewhat difficult position, as it is opposing price prescriptions for distributors' codes covering food products. It has permitted the rice millers to embody in their code a price prescription somewhat like that sought by the flour millers, but there is this difference: the rice millers' code contains a trade agreement.

After informal discussions extending through a couple of months, without any agreement being reached between the millers and the A.A.A. authorities on principal issues, the millers, on Oct. 6, formally filed their proposed code of fair competition. The proposed code embodies the minimum wage and work-week provisions of the P.R.A. arrangement under which the millers have been operating. Unfair trade practice provisions would prohibit rebating, on the score of both prices and commissions; likewise premiums, waivers and refunds, commercial bribery and guaranty against price declines. In the matter of packaged and self-rising flours, differentials would be held to those prescribed by the National Millers' Federation. Carrying charges when, because of the buyer's fault, deliveries are not accepted within the time prescribed by sales contracts (not more than 90 days) would be one-third of a cent a barrel for flour and 1 cent a ton a day for mill feed.

Plants would be limited to a maximum of 144 hours' operations a week, and no increase in capacity or setting up of new mills would be allowed except by permission of the Secretary of Agriculture.

The minimum-cost formula would be administered by a millers' executive committee which in determining averages would be governed by actual figures gathered from the mills by the Millers' National Federation.

"Destructive price cutting is declared to be an unfair trade practice," says the proposed code, and the millers' executive committee as well as the Secretary of Agriculture would have power to make any inquiries necessary to uncover such practice in the industry. Monthly reports would be required of millers, and books and records of all members of the industry would be subject to inspection at any time.

The code would not apply to sales by millers of grocery specialties in packages of 5 lb. or less, but such articles could not be used as gifts to induce other purchases. And only the labor provisions would apply to exported products.

The millers contend that the proposed minimum cost basis would not assure to any miller a full return for all costs ordinarily involved in his operations and that, therefore, no evil could result. "The minimum cost basis," the millers say, "is merely the formula for measuring destructive price cutting."

The flour millers have registered objection to being included in the proposed master code for all food distributors. Hearings have been held on that code, but the code has not been passed on as yet by the authorities. As it was framed tentatively, that code would include manufacturers as well as distributors of food products. The millers ask that it relate to their products only after the products have passed from their control.

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Dairymen Are Disappointed Over Policies of A.A.A.

Leaders of dairy cooperatives have no patience with the rate at which milk marketing agreements are being put into effect. When approximately 1,000 of them met in Chicago, Oct. 9-11, at the annual covention of National Cooperative Milk Producers' Federation, great disappointment was expressed "over the trend of policies with respect to marketing agreements and slowness with which these agreements are passing through A.A.A."

In answer to this criticism by the dairymen representing 36 states, the Administration explained the delay in enforcing the Chicago milk marketing agreement. One reason for the delay was said to be a pending federal investigation of labor and union conditions in the Chicago area.

It is said that Washington has a complete record of distribution costs taken from the books of distributors in Chicago. The records show, it is reported, that 60 per cent of the cost of a 10-cent bottle of milk in the Chicago area goes to drivers and plant labor. Of that 60 per cent, almost 40 per cent is the wagon driver's share. This is a result of strong labor unions.

A breakdown of the 10 cents that the consumer pays for a bottle of milk delivered to his door, as supplied by one of the large distributors, shows that roughly 3.7 cents goes to the wagon driver, approximately 2.4 to plant labor and about 3.5 to the farmer. The balance of 0.4 cent is the distributor's share, out of which must come cost other than plant labor.

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Late News Flashes

Hugh S. Johnson has explained that the recently approved Retail Trade Code does not affect the retailing of food and foodstuffs, leaving these products open to loss-leader selling. . . . The public hearing on the coffee code has been concluded, with practically no opposition to the code as submitted.

What About the *Small* 3-Axle *Truck?*

CONSIDERABLE development has taken place during the past five years in the design of the three-axle truck (more commonly called the six-wheeler) as the means to increase gross loads without increasing axle loads. The necessity for restricting axle loads has been brought about by the fact that both roads and bridges are designed as beams which are liable to damage or failure if the concentrated loads to which they are subjected are too great.

The weight of the truck carried on a road or bridge is concentrated at the points at which the truck touches —the tires—and these are connected through the springs and axles. Hence the weight of the truck is concentrated at its axles so far as the road or bridge is concerned. If a truck having a gross weight of 30,000 lb. has 8,000 lb. concentrated on the front axle, the balance of 22,000 lb. must be concentrated on the rear axle on a two-axle truck. The rear axle load being the heavier, it is this load for which the road or bridge must be designed to carry with safety.

Permits Greater Gross Load

It is evident that if a third axle is placed sufficiently ahead of the rear axle of the truck mentioned above to spread the concentrated load, the rear axle load concentration may be roughly one-half on each of the two rearmost axles. In other words, with a three-axle truck weighing 30,000 lb. gross, the concentration may be 8,000 lb. on the front axle; 11,000 lb. on the second axle and 11,000 lb. on the third axle. The maximum axle concentration is thus reduced 11,000 lb., as compared with the two-axle truck of the same gross weight.

Now if the maximum axle load is restricted by highway laws to 18,000 lb., it is evident that the two-axle truck with its 22,000 lb. rear axle load could not be operated and be within the law. However, if a third axle is added, with the same allowable axle load of 18,000 lb., the gross truck weight may be increased to 8,000 lb. plus 18,000 lb. plus 18,000 lb., or 44,000 lb. in all. Hence the ability of the three-axle truck to increase gross truck loads. It is not quite as simple as just explained, since vehicle speeds, kinds of tires, distance between axles and bridge beam spacings all have something to do with the details of increasing gross truck loads.

While the advantage of the third-axle truck to increase gross weights seems quite clear, a later adaptation of the same idea does not appear as sound. This is the inclination of some owners in the food field to take a 1½-ton truck in the Ford or Chevrolet class; add a third axle and get a 4- or 5-ton truck at much less cost than any conventional truck of the same capacity. Is this an attempt to get something for nothing? Has it a parallel in the type of Smith Form A trucks of 1917 and 1918 in which a chain-driven rear axle was substituted for the rear axle of a Ford passenger car to make a 1½-ton truck?

Gives a Low First Cost

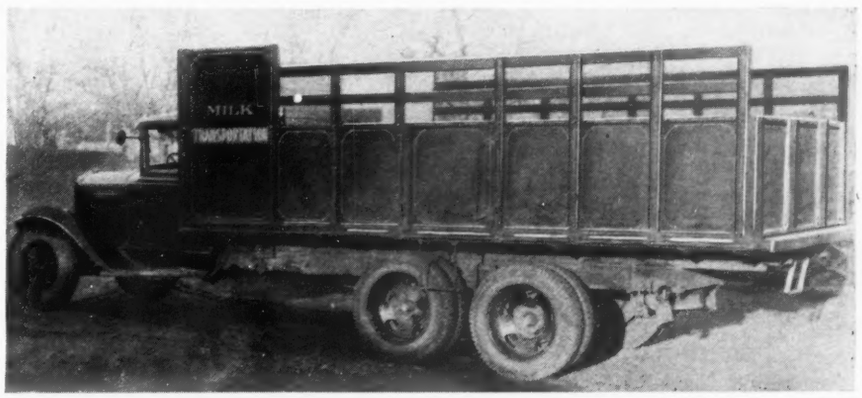
It is certain that no question of gross allowable weights is involved. Rather is it to obtain a truck of low first cost and low depreciation charges. The addition of the third axle to a 1½-ton truck to carry 4 or 5 tons certainly gives a much cheaper unit than any 5-tonner. But depreciation charges based on the life of the job and its performance in service are losses of a different color.

Many owners of such converted outfits assert that they are being operated at no greater maintenance and repair costs than the regular light truck without the added axle. With six tires in place of four, or ten tires in place of six, tire costs must be greater. And how the same power plant and propulsion members can move double the load over an extended period at the same repair cost and at the same fuel and oil cost seems to be against all generally accepted engineering and economic principles.

Other Factors Involved

And what about performance? Can it be possible that a given power plant can move double its intended load at the same road speeds and have the same hill-climbing ability? Can the economic life of a truck so loaded be the same as with less than half that load? And if not, how can depreciation charges be lowered? If all such claims cannot be justified by facts developed through experience, how can the claims for lessened cost per unit or ton hauled be substantiated?

While much more might be said on the subject, it would seem that the wise fleet owner in the food field should get the answers to the questions stated above before determining upon a policy of using such converted vehicles as a means of permanently reducing his trucking costs. Otherwise he may be in the position of buying for today and letting tomorrow take care of itself and of finding that over a period of years his transportation costs are higher instead of lower.



Here's a 157-in. wheelbase 1½-ton Ford fitted with a third axle and a 15-ft. body. It is reported to carry 139 cans of milk weighing 115 lb. each, or a total pay load of 8 tons! Can it be possible that outfits such as this point the way to permanent reduced transportation costs?

ABSTRACTS OF
Current Literature

ERGOSTEROL IN MUSHROOMS. Midzuho Sumi. *Scientific Papers of the Institute of Physical and Chemical Research.* Tokyo Imperial University, Vol. 20, pp. 254-258; April, 1933.

The edible mushrooms of Japan, either wild or cultivated, are fairly rich in ergosterol. This has been proved by chemical identification and by formation of vitamin D in the mushrooms under the action of ultra-violet rays. The ergosterol in mushrooms is exactly the same as that of yeast. The gills of the mushroom are richest and the stem poorest in ergosterol, the flesh being intermediate. Of fifteen varieties of edible mushrooms, *Hydnum aspratum* contained most ergosterol, 0.268 per cent calculated on the dry matter; the one known in Japan as *shiitake* was second, with 0.264 per cent. This compares favorably with dried baker's yeast, containing 0.365 per cent. The figures given are for the harvesting age of the mushrooms, when the ergosterol content is somewhat greater than in immature mushrooms.

EFFECT OF DAIRY PROCESSES ON MILK. W. B. Nevens and D. D. Shaw. *Journal of Nutrition,* Vol. 6, pp. 139-150; March, 1933.

Apparent digestibilities of the total protein, fat, sugar and total solids of fresh whole milk, spray process powdered whole milk, and roller process powdered whole milk have been studied. The protein of fresh whole milk has a significantly higher digestibility than that of powdered whole milk. The fat and sugar of both fresh whole milk and powdered whole milk were found to be practically completely digestible. No significant differences in the apparent digestibility of the two kinds of powdered milk were found.

PRESERVATIVE ACTION OF SPICES AND RELATED COMPOUNDS AGAINST YEAST FERMENTATION. J. W. Corran and S. H. Edgar. *Chemistry and Industry,* Vol. 52, pp. 149T-152T; May 26, 1933.

The effects of various spices, condiments, herbs and their oils on fermentation by ordinary yeast *(Saccharomyces cerevisiae)* have been examined. Mustard flour was most efficacious, with cloves and cinnamon following. Little or no preservative action could be detected with caraway, nutmeg, ginger, black and cayenne peppers and other materials tested. Mustard and its volatile oil are definitely stronger than either benzoic acid or sulphur dioxide. Cloves spice has a potency of the same order as that of benzoic acid, and superior to that of sulphur dioxide.

OPTICAL DETERMINATION OF WATER CONTENT OF MARMALADES, CANDIED FRUITS AND FRUIT JELLIES. Dr. F. Löwe, Jena, Germany. *Zeitschrift für Untersuchung der Lebensmittel,* Vol. 65, pp. 583-585.

The water content of marmalades, candied fruits, fruit jellies, even plum jam can be determined conveniently by use of the butyro-refractometer, as the percentage of water lies between 20 to 50. A single drop of the substance suffices for a test. Scales based on the well-known tables by H. Main (*Zeitschrift des Vereins der deutschen Zucker-Industrie,* 1907, Vol. 57, p. 622) are given showing percentage of water corresponding to scale readings. Highly colored samples or samples with too large a content of solid materials (skins or pulp) cause an indistinct field of view, and may be tested by "reflected light" in a sugar or Abbé refractometer or a Goerz refractometer.

EFFECT OF BACTERIA ON RANCIDITY. C. B. Gustafson and E. H. Parfitt. *Cereal Chemistry.* Vol. 10, pp. 233-238; May, 1933.

The total bacteria count of wheat was greater than that of the flour made from it. The bacterial count of flour tends to decrease with time of storage. Self-rising and plain flours had practically the same bacterial count. With the flours studied, the total bacterial count did not appear to be a dominant factor in the development of rancidity.

NEW BOOKS

METHODS AND PROCEDURE IN FEDERAL PURCHASING. By R. J. Monteith and A. S. Burack. Published by Bruce Humphries, Inc., 470 Stuart St., Boston, Mass., 1933. 349 pp., 6½x9½; cloth; illustrated. Price, $10.

INCREASED activity of the U.S. Government in the drive for better business conditions has made it an even larger buyer of commodities than it normally is. But to sell to the government one must know his way about in making bids, certifying as to abillty to deliver, and providing for satisfactory inspection.

The authors have drawn from their own experiences, respectively, as member of Federal Purchasing Board and as manager, Government Sales Division, Bay State Mailing Service, and have sought to inform the uninitiated how they may get their products before the proper purchasing board. Subjects covered range from classification of federal purchases to how to conduct an efficient government sales department. Payments of claims and suits, statutes applicable to federal purchasing, and standardization of government purchase conditions and forms are included.

Appendices list U.S. Government purchasing agencies and retail stores maintained by or under the supervision of the government.

To the best of our knowledge, this is the first extensive compilation of practical information on the *how* of selling to the government.

MANUAL OF MICROBIOLOGY. By W. L. Obold and Margaret M. Diehm. Published by F. A. Davis, Philadelphia, Pa., 1932. 140 pp., 6x8¾; illustrated; cloth. Price, $1.25.

FOOD bacteriology is one of the important divisions of microbiology. Upon it food preparation, preservation, and spoilage are based, as is the laboratory control of milk and water supply.

A manual such as this serves as a guide for the beginner or for one who has not had reason to keep brushed up on the details of laboratory technique. Of particular interest are the chapters on yeasts and on bacteria classification.

pH AND ITS PRACTICAL APPLICATION. By F. L. La Motte, W. R. Kenny, and A. B. Reed. Published by Williams & Wilkins Co., Baltimore, Md., 1932. 262 pp., 6¼x9¼; illustrated; cloth. Price, $3.50.

WRITTEN for the plant man interested in its practical application, here is an entirely different treatment of hydrogen ion control of industrial processes and laboratory experiments. It discusses water-corrosion problems, the disposal of sewage and factory wastes, and the regulation of acidity and alkalinity of liquors used in sugar- and gelatin-making processes. There is an entire section on the relation of hydrogen ion concentration to milk, flour, fruit, jellies, and canned goods, which should be valuable to food technologists.

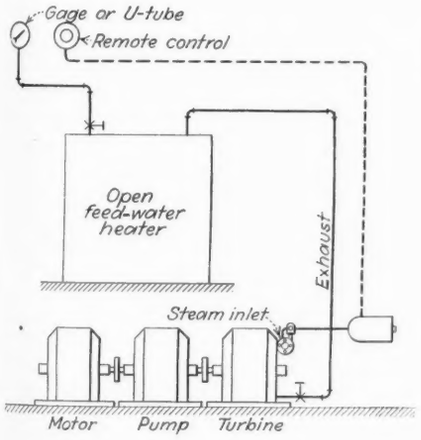
IDEAS . . . FROM PRACTICAL MEN

A Feed-Water Heat Balance

Synchronism between the quantity of exhaust steam required to heat the feed water and the quantity available connotes efficiency, but in many plants that condition does not exist.

When there is deficiency in exhaust steam, the feed-water temperature can be maintained by the use of live steam, but this is not the most economical way; and an excess of exhaust steam is a total loss. It is possible, however, to have a continuous heat-balance. The solution is to have one or more of the auxiliary machines driven by both steam and electricity, thus permitting regulation of the quantity of exhaust steam from the auxiliary. This plan is illustrated in the diagram. The pump can be driven either entirely by the motor or entirely by the turbine, or the load can be shared by both.

In one particular plant, a line was run from the heater to the switchboard and here it terminated in a



mercury-filled U-tube. The turbine was provided with remote control so that its load could be varied from a distance. It was decided to keep a pressure of 1 in. of mercury in the heater at all times, and the operator, by looking at the U-tube, could regulate the load of the machine to suit. There was no further loss from excess exhaust steam and 3 per cent reduction in fuel was effected. This system can be installed at a small cost compared to the reduction in fuel it will effect.

N. T. PEF, *Chicago, Ill.*

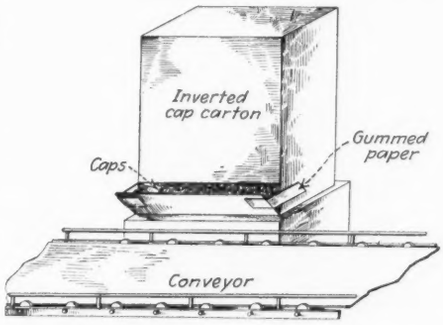
IDEAS ACCEPTED

Put your pet ideas in writing, make sketches where necessary, and send them in. Remuneration starts at $3 for each item accepted.

—THE EDITORS

Automatic Feeder for Caps

There is an easy way to make an "automatic" feeder for caps used in hand-capping operations. This is done by slightly remodeling the carton in which the caps are packaged. First, cut the carton across one side, near one end. This produces a flap which



is opened out and fastened at an angle with gummed paper. This forms a reservoir into which the caps feed by gravity. The remodeled carton is placed alongside the conveyor carrying the containers.

WILLIAM M. DEWALL, *Baltimore, Md.*

Why Hot Water Binds Pumps

Considerable difficulty is sometimes experienced in pumping hot water, because of the tendency for steam to bind the pump. Since water vaporizes at lower temperatures when its pressure is below the pressure of the atmosphere, there is a practical limit to the suction lift. At the higher temperatures, a positive head is necessary on the pump suction to overcome friction losses in the line and in the pump itself.

The table gives the maximum allowable suction lift for low temperatures and minimum allowable static head of water above pumps at higher temperatures to insure satisfactory operation. The data apply to reciprocating, or positive displacement pumps. For centrifugal pumps water should flow to the pumps under a positive head if the temperature exceeds 120 deg. F. Above this temperature the lower part of the table will apply.

Practical Suction Lifts

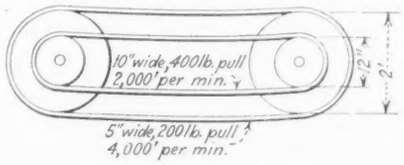
Temperature (deg. F.)	Maximum lift (Ft.)
60	22.0
80	17.8
100	13.0
120	8.6
140	4.0
158	0.0
At temperatures above 158 deg. F. a positive head is necessary.	
170	2.3
180	4.8
190	7.0
200	9.3
212	12.0

Water at temperatures above 212 deg. F. will be under a pressure, so that the static suction head need not be increased. In any case, the suction line to the pump should be adequately sized, free of air pockets and as short and free of bends as possible.

S. H. COLEMAN, JR., *Roanoke, Va.*

Large Pulleys Cut Belt Costs

Where small-diameter pulleys are used, belting costs often can be cut almost in half by the installation of larger pulleys. The pull on the belt is dependent upon the pulley diameter, as indicated in the diagram. The larger the pulley the less the pull. In the application illustrated, a 10-in. belt is required with a pulley diameter of 1 ft., the speed being 2,000 ft. per minute and the pull 400 lb. If pulleys of a 2-ft. diameter are substituted, the pull will be only 200 lb., and a 5-in. belt will do the work. The speed in this case will be 4,000 ft. per minute, which is not excessive.



In addition to reducing belt costs, some power is saved with the smaller pull. Belt life also is lengthened, since the tendency to slip is minimized and the radius of curvature of the belt is made smaller (on a small pulley, bending of the belt often causes the laps to part).

W. F. SCHAPHORST, *Newark, N. J.*

NEW PRODUCTS—
—NEW METHODS

A Tumbler—and Decorated

Decoration seems to be the latest development in reuse glass packages. While most of the reuse glass containers now marketed serve adequately as tumblers, Williamson Candy Co., Chicago, Ill., has gone further by adopting a tumbler with artistic appeal. Spiraled flutes and two narrow bands, one white and one colored, decorate the container for Princess Pat peanut butter. The package was designed by Hazel-Atlas Glass Co., Wheeling, W. Va.

Thickens and Seasons

Broccoli and cauliflower are but two of the vegetables used in concentrated form in Chef Ellis Gravi, developed by Ellis Certified Co., New York, N. Y. The liquid mixture is intended as a thickening and seasoning agent for gravies and sauces. According to the manufacturer, the product contains no animal matter. It is distributed by International Marketing Co., New York, N. Y.

Two-in-One Concentrate

Both vitamins B and G are contained in the vitamin B complex concentrate newly developed by Pacini Laboratories, Inc., Chicago, Ill. The concentrate smells like honey and tastes pleasant. It is available in either solid or liquid form, and is compatible with any kind of food or medicinal product. Its potency is not less than 30 and as high as 40 units per gram, according to the manufacturer.

Containing both the B_1 and B_2 factors, the concentrate thus should provide resistance in the body to beriberi and pellagra, cause better assimilation of food, and keep the appetite keen.

Diet Adjunct From Kelp

Seaweed is the source of a new contribution to the rapidly growing group of health foods. The new food is Parkelp, developed by Philip R. Park, Inc., Chicago, Ill. The kelp (*Macrocystis pyrifera*) grows along the coast of southern California in beds 30 miles off shore and 200 miles long. The tops are cut off, dried and chopped fine. All processing to concentrate the kelp is done so as to retain the organic minerals and vitamins of the green plant. "No chemicals, stimulants or drugs are added," says the manufacturer.

The product contains natural iodine, iron, copper, phosphorus, sodium, potassium, magnesium, sulphur, and other minerals. Their combination is said to have the effects of vitamins A, B, D and E on the human body.

Prepared Gingerbread Mix

The addition of a cup of water before baking is the sole direction to the user of Dromedary Gingerbread Mix, manufactured by Hills Bros. Co., New York, N. Y. The dry mixture contains flour, sugar, molasses, egg, vegetable shortening, spices, baking powder, milk, soda and salt. The recipe used is said by the manufacturer to be a replica of that used by Mary Washington, mother of the first President.

The product is packed in a cardboard carton wrapped in transparent cellulose and weighing 14 oz. net. It is guaranteed with a "like it or your money back" offer.

Whole-Grain Health Bread

Scandinavian health bread, or *knaeckebrod,* is now on the market in three varieties—whole wheat, whole rye and whole oat. It is manufactured by Skoal Baking Co., Long Island City, N. Y. Made from the flour of the whole grain, the bread is baked and dehydrated; it contains, according to the manufacturer, only 6 per cent water by weight. Furthermore, it is supposed to be non-fattening and to contain highly necessary vitamins and mineral salts.

"Skoal" bread is packaged in several ways: a transparent cellulose-wrapped carton for family use, containing 40 individual slices; a round, paper-wrapped package containing six large flat sheets; and a small, square package, wrapped in glassine and transparent cellulose, containing 11 slices. The large packages weigh 1 lb., net, or more.

Crock for Many Reuses

Old-fashioned pork sausages are now packed in lard in small earthenware crocks possessing both eye appeal and reuse value. Each package contains 12 "Crock O' the Farm" link sausages in 4 or 5 oz. of pure lard. The crock, about 3½ in. deep and 4 in. in diameter, has many uses, such as: a refrigerator container; a preserve or tobacco jar, a flower or bean pot, or a cheese or butter crock. The product is marketed by Stahl-Meyer Inc., New York, N. Y.

Canned Clam Chowder

One of the youngsters in the soup family is New England clam chowder, manufactured and packed by Gorton-Pew Fisheries Co., Ltd., Gloucester, Mass. The can holds 17 oz. of stock; the recipe requires the addition of an equal quantity of water or milk for the finished chowder. The stock contains the usual ingredients of clam chowder, including "Down East" soft-shell clams.

Syrup Core in Frozen Bar

Another variety of packaged ice cream is the roll recently produced by Esmond Dairy Co., Sandusky, Ohio. It consists of a bar of ice cream inclosing a core of flavoring and coated with almond bisque. The piece is made with special equipment manufactured by Industrial Appliances, Inc., this being operated in conjunction with a Vogt continuous freezer. The ice cream extruded from the freezer is comparatively stiff, and the flavoring is introduced into the center of the roll under pressure. The piece is 6 in. long and about 1½ in. in diameter. Its shape and the shape of the core may both be varied. There may also be variations in flavor combinations. A bar is produced in the same way as the roll, and is coated with chocolate. Both pieces are wrapped in waxed paper, which can be stripped down as the ice cream is eaten.

Airtight Bottled Cider

Pre-repeal cider now sells in a sauterne bottle closed with a crown cap instead of a cork. It is Gold Medal 4 per cent cider bottled by S. Martinelli & Co., Watsonville, Calif. The use of the crown closure results, says the bottler, in lower unit cost, increased production, and greater display convenience. The cork closure previously used dried out and admitted air, thus allowing spoilage of the contents.

Smoked Sea-Food Loaf

Sea food is now to be had in new form as the result of a special process called "staking." With this method, the choicer parts of less expensive fish are cut into small pieces and pressed into a rectangular mold. The molded meat is subjected to a series of heat treatments, sterilized and smoked. During the processing, no chemicals, extracts, coloring, flavoring or other foreign materials are added. Staking was developed by Sturmack Co., Brooklyn, N. Y.

The product, called Sturmack, is marketed in 1- and 2-lb. loaves wrapped in transparent cellulose and packaged in paper cartons. A small retail package containing 3 oz. of sliced loaf is planned by the manufacturer. Staking is said to be applicable to many other kinds of food, including vegetables.

Add Hot or Cold Water

Liquid coffee concentrate, requiring only the addition of hot or cold water to make any given quantity of coffee, is being distributed by Ray Hawley Associates, New York, N. Y. It is an extract said to retain all the flavor, aroma and stimulation of the coffee bean. One teaspoonful of the Minute Made concentrate in one cup of hot or cold water makes one cup of coffee of normal strength. It is packaged in 3-oz. bottles wrapped in transparent cellulose. The manufacturer is Minute Made Food Products Co., Atlantic City, N. J.

Flavored and Toasted

Tasty, gentle and effective, Instant Manam Syladex is one of the later solutions to the elimination problem. Made by Natural Health Products Co., New York, N. Y., its ingredients are lubricating seeds (possibly psyllium), agar-agar, lactose, dextrin, and fruit flavoring. This mixture is milled and toasted. Containing no drastic drugs or harsh purges, it contributes the bulk and lubrication necessary in a laxative.

It is packed in a tin container holding 1 lb. net. It was introduced by Charles & Co., grocers, New York, N. Y.

What Food Men Are Doing

Bakers Discuss Industry's Problems In Four-Day Meeting at Chicago

"Don't be afraid of the new deal," Chairman L. J. Schumaker told members of American Bakers' Association at the opening session of the annual convention, held in Chicago, Oct. 9-12. "But realize your duty and responsibility toward the N.R.A. Courage, cooperation and confidence are needed."

President Henry Stude, touching upon the government's attitude toward bread prices, said that it was unfortunate that an industry with a record like that of the baking trade must stop every so often to answer some unwarranted and unjustified allegation about the price of bread. In pointing out how the baking industry "has done its part," Mr. Stude called attention to the fact that the industry is collecting $1,000,000 a week from consumers for the farmer and that it has 30,000 more wage earners than it had last March.

Speaking of the long delay on the code, which has been prepared but not acted upon, Mr. Stude reminded the bakers that it was necessary to work on the code until its provisions would meet future as well as present conditions. Once made a law, it probably would be years before measures of the code could be repealed.

The much discussed question of what kind of cake the ladies want was covered in a talk by F. B. Evers, delivered at the joint session with American Society of Bakery Engineers. "Cake bakers have one outstanding advantage: the amount of cake being consumed today is from three to four times the amount now made by the bakers," Mr. Evers said. He then cited a survey in which 3,000 women were questioned as to their objections to bakers' cakes, with the following results: 82 per cent were suspicious of ingredients used; 60 per cent did not like the flavor; 52 per cent wanted richer cakes; 48 per cent said bakers' cakes were not fresh; 30 per cent did not like the texture; and 25 per cent did not like the icings. Any baker can produce the kind of cake the housewife bakes, Mr. Evers stated, provided he follows her recipe and adapts his methods and equipment to give the same type of processing.

Other practical addresses at the joint meeting included: "Correlation of the Production and Sales Departments," Carlos S. Pickering; "Quality vs. Costs Under the Bakers' Code," Peter G. Pirrie.

A resolution was drawn up at the convention to the effect that the organization renew its pledge of support to Secretary Wallace to the end that the maximum amount of the consumers' dollar shall reach the farmer.

The following were elected to the board of directors: N. M. Zinsmaster, August Nolde, Joseph Hexter, William Phillips, Julius Colman, S. S. Waters, Wallace McPherson, Lee Marshall and N. G. Jordan.

Clarence Francis
Executive vice-president of General Foods Corp., outstanding authority in the food field, and member of master code committee, who has been named adviser to N.R.A. in its consideration of food industry codes.

Packers Meet at Chicago; Meat Supply Forecast

Nearly 1,000 packers got together in Chicago from Oct. 20 to 24 to consider the effect of the New Deal upon their businesses and to discuss operating and marketing problems. At this annual convention of the Institute of American Meat Packers, there seemed to be current a feeling that some of the steps taken by the government would reflect unfavorably on the packing business.

Speaking on the marketing agreement, Thomas E. Wilson, chairman of the processors' committee, told the group that after working on ten different agreements, the Davis agreement was developed, this now being in Washington and believed to be on the way to approval.

Of particular interest to the packers was a forecast of livestock supplies by G. L. Harlan, of the Bureau of Agricultural Economics. Total inspected meat production during the next twelve months, Mr. Harlan predicted, would be little different from the total for the past twelve months. However, the live weight of hogs slaughtered during the 1933-34 marketing year probably will be about 12 per cent smaller than last year. Considering cattle, the government statistician estimated that there is an upward trend in the slaughter of both cattle and calves, and that this likely would continue for several years. This should be good news to dairymen, since it may indicate a turn in the cow cycle. The killing of lambs from November to April will decrease somewhat, the forecast indicated.

Production of meat and lard in the livestock marketing year just closed was larger by about 500,000,000 lb. than in 1932, Wm. Whitfield Woods, president of the institute, told the packers. All kinds of meat except lamb contributed to the increase.

At the closing session, John W. Rath was reelected chairman of the board; Wm. Whitfield Woods was reelected president, and H. Harold Meyer again was chosen secretary-treasurer.

A.B.C.B. Meeting Addressed By Donald R. Richberg

Between 4,000 and 5,000 bottlers assembled at Louisville at the annual meeting of American Bottlers of Carbonated Beverages, Oct. 9-13. Approximately 100 manufacturers of beverage supplies, equipment and machinery were there to display their products, and unexpectedly large orders are reported. It is apparent that the industry looks toward an increase of business in 1934.

The bottlers were much interested in labor relations and price control. When Donald R. Richberg, general counsel for the N.R.A., addressed the convention on this subject, so many attended the session that it became necessary to hold

it in a local theater instead of the convention hall of Jefferson County Armory.

Following Mr. Richberg's talk, the A.B.C.B. industrial planning committee reported on the status of the permanent code for the industry. Formal hearings on the code are expected in the near future, and an open forum was held at the convention to obtain suggestions for rules for fair competition to be included in it.

The problem of taxation, so troublesome to bottlers, was considered in a speech by Congressman Fred M. Vinson. He indicated that Congress has in mind a general revision of the taxation system to insure more equitable division of tax burdens. Mr. Vinson is a member of the Ways and Means Committee which is drafting the 1934 Revenue Bill.

Practical bottling problems were taken up at five special meetings during the week. The addresses at these meetings included:

"Some Problems in the Production of Quality Beverages," Dr. Max Levine; "Beverage Standards," Dr. Julian H. Toulouse; "Citrus Fruit Beverages," W. E. Baier; "Carbonated Apple Juice," D. C. Carpenter, "Flavoring Extracts," G. M. Chapman; "The Proper Use of Beverage Manufacturing Machinery," G. J. Huntley; "Refrigeration," A. H. Reinach; and "Increasing Your Profits," J. P. Curran.

Martin L. Schmidt, president, and other officers of the A.B.C.B. were re-elected. Other officers are Thomas Moore, vice-president; I. M. Oberfelder, treasurer; Junior Owens, secretary.

Pushes Food and Drug Act

"The framers of this code agree to abide by such regulations, in anticipation of the food and drugs act, as the Secretary of Agriculture may lay down." This phrasing constitutes the acceptance of the proposed food and drugs act which Dr. Frederic C. Howe, the consumer counsel of A.A.A., has attempted to put into the codes of food processors. According to Dr. Howe's admission, this attempt has met with no great success, but they "have not let up on the fight."

Processing Taxes Fixed For Pork and Corn

Meat packers and corn products manufacturers must pay a processing tax, beginning Nov. 5 and continuing for two years. The packers will pay 50 cents per 100 lb. at the start, and the rate will be increased gradually until Feb. 1, after which it will be $2, or 2 cents a pound, live weight, for the remainder of the period. This tax is strongly opposed by meat packers. The tax levied against corn products manufacturers will amount to 28 cents on the bushel.

Some $45,000,000 of the hog-tax receipts and an equal amount of Emergency Relief Administration funds will be used to buy about 400,000,000 lb. of swine for distribution to the needy. This supplements the program ending at the close of September, during which 6,200,000 pigs and 200,000 sows were slaughtered.

The estimated $60,000,000 to $70,000,000 from the tax on corn, together with $40,000,000 from N.R.A. funds, will be spent as benefit payments in reducing corn acreage, the benefit being 30 cents a bushel. Adjustment payments of $5 a head on 75 per cent of the farmer's average number of pigs will be paid to those reducing their crop by 25 per cent.

As a result of the corn-hog plan, a compensatory processing tax on beef may be necessitated.

From the Hoof to the Table

The story of meat from the farm to the consumer has been vividly and clearly told to some 20,000 people every day at the Chicago Fair. This view of the exhibit shows a model white-tiled meat cooler and a refrigerated truck. Next to the cooler was a refrigerator car loaded with meat. The meat is of wax, but quite real in appearance.

Kraut Packers Pay More

Cabbage growers in New York, Ohio, Wisconsin and Michigan are receiving $5.50 a ton for their product instead of an average of $4, the price stated in their contracts with packers. This is a result of action taken by National Kraut Packers' Association in response to a request from the A.A.A. The increase amounts to 37.5 per cent. However, it still leaves the contract price below the open market price, but this is principally because of an exceptionally short crop. The price of $5.50 a ton represents approximate parity with price prevailing in the 1909-14 base period.

Hors d'Oeuvres

AT THE FIRST International Beer and Wine Show, to open in New York, Feb. 19, a $1,000,000 exhibit of utensils will show the art of drinking over a period of some 2,500 years. We need some sort of inspiration to shake off that plastering technique of speakeasy Rembrandts.

•

FOLLOWING a run of beer ads making well-founded but unexclusive claims, a prominent brewery breaks forth with an ad pointing out that all of these "superior" qualities are incorporated into its beer. All of which should mean something to advertising managers.

•

"MAKE THEM EAT CAKE," said General Mills, and so saying proceeded to sell an additional 5,000,000 of the bakers' angel food cakes to the nation's housewives during a single week's advertising campaign.

•

"WOULD you like to sample Elanore. We pay the freight." This caption appears under a revealing front view of a girl bending over a water fountain in the ad of a Kansas flour milling company. Editor's Note — Elanore is a flour.

•

IN INDIANAPOLIS the Swiss Goat Dairy puts up goats' milk in fancy printed containers and delivers it daily to the Hoosiers. Someone please page Mahatma Gandhi.

•

THE ELGIN (Ill.) dairy products manufacturer who made all the noise about closing shop rather than conform to N.R.A. is still in business. Make your own comment.

•

UNSCRUPULOUS bakers in Los Angeles puffed up their doughnuts so much that the city has been asked to fix a standard weight for them. Why not establish a standard dunking characteristic, too?

Looks Like It—But Isn't

It appears to be a night view of a modern bakery working full blast. In reality, it is the model bakery exhibited at the World's Fair by National Biscuit Co. Five mechanics worked seven months to build the model. Containing 350,000 parts, it is complete and accurate in detail.

Wallace Scraps Sugar Plan; A.A.A. Studies Tax Levy

Domestic cane and beet sugar producers are still optimistic as to benefits to be derived from A.A.A. action in the sugar industry. Secretary Wallace scrapped the sugar stabilization plan of John L. Coulter early in October, but since then several proposals have come up for consideration.

Among these is a plan calling for fixed advances to cane and beet producers similar to those under the 10 cent cotton loan plan. It would require no reduction of acreage, but would stipulate that the producers should not increase production. Another plan provides for a processing tax on sugar, which would be returned to the producer in the form of a bounty, and a system of allotments.

The latter falls in with the ideas of Secretary Wallace, who has maintained in the past that production of cane and beet sugar is uneconomical here and would be better left to Cuba.

Government Will Purchase Surplus Foodstuffs

Tired of the paradoxical starvation in a land of plenty and fed up with the price depressing agricultural surpluses, the government has inaugurated a program to eliminate the two evils by throwing the one against the other. Through the Federal Surplus Corp., the government will buy large quantities of foodstuffs, the funds being provided jointly by relief funds and processing taxes.

It is understood that the plan contemplates the purchase of farm products already processed, with the exception of wheat. Butter will be purchased at the rate of 9,000,000 lb. a month, this program being handled by the newly formed Dairy Marketing Corp., an industry-sponsored organization of which John Brandt, president of Land O'Lakes Creameries, Inc., is president.

The relief distribution of pork will continue, and bids for the purchase of 15,000,000 lb. of beef were called for on Oct. 25.

There are practically no limits to what the Federal Surplus Relief Corp. can do under its proposed articles of incorporation.

Hearing on Master Code Is Distribution Forum

The master code of the grocery industries went over the bumps at the long awaited hearing in Washington which began Oct. 9 and lasted so long that at the end of the fourth day, including two night sessions, the audience numbering about 400 at the opening dwindled to a mere handful. Oral testimony filling five huge volumes and totaling over 1,100 pages was taken. Every conceivable angle of distribution was discussed.

The biggest discussion and most heated argument centered about brokerage diversion and minimum mark up of 2½ plus 7½ per cent. Not a word was mentioned publicly about free deals, largely because too many customers of manufacturers were present, and because many probable objectors had gone home. Requests for exemption from operation of the master code were filed by the following producing groups, which stated they were working on separate industry codes: U. S. Fisheries Association, National Canners' Association, Millers' National Federation, National Fresh Fruit and Vegetable Council, Retail Tobacco Dealers of America, American Spice Trade Association, National Confectioners' Association, Lobster Fisheries Association, National Macaroni Association.

The code is now in the hands of the A.A.A. for final revision and approval. The question of minimum mark-up policy for both this code and the N.R.A. retailers' code must be settled by the Administration before much can be accomplished on the grocery code. As soon as the master code is an established fact other code decisions are expected to follow rapidly.

CONVENTIONS

NOVEMBER

6-8—Association of Official Agricultural Chemists, Raleigh Hotel, Washington, D. C. Dr. W. W. Skinner, Box 290, Pennsylvania Ave. Sta., Washington, D. C., secretary.
10—National Malt Products Manufacturers' Association, New York. S. L. Goldman, 160 North La Salle St., Chicago, secretary.
14-17—National Association of Ice Industries, Roosevelt Hotel, New Orleans. Leslie C. Smith, 228 North La Salle St., Chicago, secretary.
29-Dec. 1—Southern Association of Ice Cream Manufacturers, annual, Hotel Roosevelt, New Orleans.

DECEMBER

4-9—Fourteenth Exposition of Chemical Industries. Charles F. Roth, Grand Central Palace, New York, manager.
5—American Association of Creamery Butter Manufacturers, Palmer House, Chicago. W. F. Jensen, Room 1404, 110 North Franklin St., Chicago, secretary.
6-8—American Institute of Chemical Engineers, Roanoke Hotel, Roanoke, Va. F. J. LeMaistre, 808 Bellevue Court Bldg., Philadelphia, Pa., secretary.
8—National Livestock and Meat Board, Stockyards Inn, Chicago. R. C. Pollock, 407 South Dearborn St., Chicago, secretary.
—National Dairy Association. H. E. Van Norman, 111 North Canal St., Room 1002, Chicago, chairman, executive committee.

Good News on Freight Rates

Canners packing in glass containers got a "break" on shipping rates when the Interstate Commerce Commission on Sept. 26 put into effect a new schedule placing glass-packed products on a parity with those packed in tin. This has saved the packers from 20 to more than 50 per cent in freight charges.

Now comes more good news on the freight question. Transcontinental railroads requested the Interstate Commerce Commission on Oct. 10 to vacate suspension of a general reduction of 10 per cent per 100 lb. in 60,000-lb. carload

rates on canned goods from the Pacific Coast to the Middle West, filed to become effective Oct. 1. The proposed rate of 80 cents per 100 lb. is designed to meet a joint rate of 76 cents via Panama Canal steamship lines and railroads serving Gulf ports in effect since Sept. 20.

Thomas Patent Upheld

It has been decreed by California Sanitary Co., Ltd., that the Thomas patent for canning spinach, held by California Packing Corp., is valid. This acknowledgment followed a suit by the latter charging infringement of the patent by the former. Since California Sanitary Co. concedes the validity of the patent, it has agreed to pay $2,000 in damages to California Packing Corp. and has taken a license from that company.

Bakery, Sugar Strikes End

Concerted strikes of New York flour truck drivers and supply bakery drivers, who walked out on Oct. 2, ended three days later when concessions to the flour truck drivers were granted by employers. The drivers were granted a five-day, 48-hour week with a wage scale from $43 to $55 for drivers and $40 to $45 for helpers.

Two strikes in Philadelphia were successfully settled, one the bakery strike, the other the Pennsylvania Sugar Co. walkout. Strikers in the latter case returned to work with an advance of 10 cents per hour to employees of one year's standing and 8 cents per hour to less experienced workers. The bakery strikers, involving bakery wagon drivers, chauffeurs and helpers and bakery and confectionery workers, returned to work on the guarantee that mediation would be carried on between their representatives and employers.

Levy on Dairy Products Discussed at Hearing

With 3 per cent more cows this year than last and with the number of milk sheds on the increase, something needs to be done about the dairy surplus. To this end, the A.A.A. proposes a processing tax on dairy products to obtain funds for benefit payments in connection with production control.

The Agricultural Adjustment Act authorizes a tax equal to the difference between the average current farm price and the fair exchange value, but Secretary Wallace feels such a atx, which would amount to about 12 cents a pound on butter, would curtail consumption and increase the surplus.

To arrive at a lower figure, a hearing was held in Washington, Oct. 16. At this session, the problem of a compensatory tax on oleomargarine and other competing products was considered, the compensatory tax being needed to prevent consumers from shifting to the less expensive substitutes. Oleomargarine interests contended that such a tax was unnecessary at this time. The dairy industry was held to be receptive to a full parity tax gradually imposed throughout the coming year.

No decision was reached on the tax, as additional briefs filed by Oct. 20 will have to be considered.

Court Holds Licensing Legal

There is nothing unconstitutional about the licensing provision of the Agricultural Adjustment Act. This is, in effect, the decision handed down by the U. S. District Court at San Francisco in connection with the Calistan Packers, Inc., case. The injunction proceedings by the Administration to restrain violations of the California peace agreement were upheld by the court, which granted a permanent injunction restraining the packers from violating the license provisions issued to enforce the agreement.

The significance of this suit is apparent when it is considered that this is the first suit brought by the United States to enforce the Agricultural Adjustment Act or any of the acts in the Roosevelt recovery program.

Rates on Vegetables Studied

Freight rates on vegetables from the South should be reduced, according to the examiner in a case on which final argument was held before the Interstate Commerce Commission late last month. Although the railroads proposed to increase rates, the charges recommended by the examiner would be lower not only than those suggested by the roads but 5 per cent lower, in general, than those now in effect.

Glass Packing in Glass House

Century of Progress visitors to the Owens-Illinois glass-block building view the vacuum packing machinery using the process adopted by some 40 leading coffee packers.

Concentrates

Violators of N.R.A. codes and P.R.A. agreements who continue to display the Blue Eagle may now be sued for patent infringement, for the "bird" has been patented by the government. Consumers' Counsel Frederic C. Howe on Oct. 18 again charged that bakers were getting increased margins of profit.

The Dairy Industries Exposition, deferred in 1933, will be held next year, some time in October . . . Independent Brewers Association has been formed to oppose the code of operation as proposed to N.R.A. by U. S. Brewers' Association and American Brewers' Association . . . Eastern sugar beet processors on Oct. 6 announced the withdrawal of trucking allowances, even to buyers' trucks calling at the factory.

At a meeting of millers in Buffalo Oct. 14, the desirability of improving whole-wheat flour was discussed, it being noted that the demand for this product increased from 750,000 bbl. in 1931 to 3,000,000 in 1932 . . . Attorney General Bricker of Ohio has ruled that brewers must obtain additional permits to operate branch warehouses and plants.

Alabama will require stamps on all cans of shucked oysters prepared in the state . . . A total of 3,050,124,000 lb. of coffee—equal to more than the average annual world consumption—has already been destroyed by Brazil . . . British brewers are deploring a decline in the consumption of beer in England . . . Ninety corporate food chains, including some 30,000 units, have formed Food and Grocery Chain Stores of America . . . Newspaper advertising constitutes over 70 per cent of the advertising of chain stores, according to a Federal Trade Commission report.

MEN . . . JOBS . . . AND COMPANIES

Industry

AMERICAN BEET SUGAR Co., Mason City, Iowa, has started processing sugar beets. Over 1,500 acres is under contract, with an average yield of 10 tons per acre indicated.

AMERICAN CRANBERRY EXCHANGE, New York, started an advertising campaign early in October to move the bumper cranberry crop of 600,000 bbl.

ARMOUR & Co. will construct 500 refrigerator cars. Armour has surrendered its charter for Pantry Maide Products Co., subsidiary which manufactured and distributed preserves. The company introduced flaked egg, sprayed egg and egg yolk at the bakers' convention. Directors and bankers for Armour & Co. are working on a new plan of recapitalization.

CHOCOLATE SALES CORP., general distributor of all Hershey products, recently opened a branch in Jacksonville, Fla., to serve the Florida and Georgia areas.

CARNATION Co. will construct a new plant at Coshocton, Ohio, at a cost of $250,000.

CLINTON PRODUCTS Co., Clinton, Iowa, is completing a 4-story factory for baby foods.

CURTISS CANDY Co., Chicago, believes companies should assist their employees in spending leisure acquired under NRA. It is preparing employee activities along educational, cultural, entertainment and athletic lines.

DAVIS CHEESE Co., Plymouth, Wis., subsidiary of Kraft-Phenix has taken over the cheese business of Premier-Pabst Corp.

FLEISCHMANN MALTING Co., subsidiary of Standard Brands, has started work on a $400,000 plant and elevator at the North Star Mill in Minneapolis.

GENERAL BREWING CORP., San Francisco, will build, at a cost of $550,000, a plant to be ready about Jan. 15.

GENERAL FOODS CORP. has set up a new sales organization plan under which district and division managers now exercise full command.

GREAT WESTERN SUGAR Co.'s 21 factories in Colorado, Wyoming, Montana and Nebraska went into action early in October.

KELLOGG Co., Battle Creek, Mich., which has had a six-hour working day since Dec. 1, 1930, announces a new pension plan for employees which provides a life income after retirement age.

KINGAN & Co., Indianapolis meat packers, are now installing an $11,000 obnoxious-vapor condenser behind the tank house which will do away with virtually all odors.

MINNESOTA VALLEY CANNING Co., Le Sueur, Minn., now provides its wholesalers and retailers with sales ammunition. This is accomplished through a 4-page insert each month in *Progressive Grocer*.

PHILLIPS PACKING Co., INC., Cambridge, Md., will enter the nationally advertised field in the 1934 February issue of *Good Housekeeping*.

PURITY BAKERY, INC., Providence, R. I., recently purchased a building and will equip it throughout with modern machinery. Daniel F. Joy heads the company.

T. S. SIMMS & Co., LTD., St. John, N. B., is erecting a plant at Berwick, N. S., for the commercial production of dried apples. Modern equipment, much of which is of the company's own design, is being installed. This equipment will eliminate seed cells, heretofore done by hand.

SPILLERS OVERSEAS, LTD., subsidiary of Spillers Milling & Associated Industries of Great Britain, has temporarily suspended operations in western Canada. Demoralized condition of the export flour market is given as the reason.

PERSONNEL

W. C. BAKER has been appointed superintendent of the Chino and Burbank (California) canneries of Libby, McNeill & Libby. R. C. TURVIN succeeds Mr. Baker as superintendent at Sunnyvale; E. BAYSE becomes superintendent at Selma.

M. DWIGHT BELL, for many years chief engineer and general superintendent of the Minneapolis plant of Washburn Crosby Co., has organized, along with five other consulting engineers, Associated Consulting Engineers.

F. E. BREWER has been named president of Western Grocer Co., Marshalltown, Iowa, and its affiliate, Marshall Canning Co.

HENRY G. BURKE was chosen secretary of National Pretzel Manufacturers' Association. Mr. Burke, an attorney and accountant, has been identified with the food industry in Baltimore.

JAMES F. BROWNLEE has been elected president of Frosted Foods Co., Inc., a General Foods subsidiary. Mr. Brownlee will continue as vice-president of General Foods Corp. and president of General Foods Sales Co., Inc. WILLIAM H. RAYE, former president of Frosted Foods, has become chairman of the board of that concern. He will continue as head of General Seafoods Corp. and Bluepoints Co., Inc.

MAYNE R. COE, of the Food Research Division, Bureau of Chemistry and Soils, will address the New York section of American Association of Cereal Chemists Nov. 14, on "Photochemical Studies Relating to Rancidity and Their Commercial Application."

HOWARD W. FILES recently was elected vice-president of Pillsbury Flour Mills Co., Minneapolis.

ROBERT FLETCHER will manage the new Swift & Co. cheese plant at Collierville, Tenn., which opens Dec. 1. Mr. Fletcher has been assistant manager of the Swift plant at West Point, Miss.

JAMES A. GALLAGHER, JR., vice-president and general manager of Union Meat Co., San Antonio, Texas, heads up a division formed by Institute of American Meat Packers to organize the plants that process tallow and greases.

J. W. GUTHRIE, former executive of Cereal Products Refining Co., is now head of the recently formed Remar-Best Bakery, Oakland, Calif.

C. H. HOWELL, vice-president of Kraft-Phenix Cheese Corp., Chicago, returned to Montreal Oct. 1 as manager of Dominion activities of Kraft. Mr. Howell organized the Canadian office 12 years ago.

N. P. HULL, Michigan Milk Products Association, was chosen president of National Cooperative Milk Producers' Federation at the Chicago meeting. John Brandt, Land O' Lakes Creameries Co., Litchfield, Minn., and W. P. Davis, New England Milk Producers, Boston, were made vice-presidents; George Slocum, Dairymen's League Cooperative Association, Milton, Pa., treasurer; Charles Holman, Washington, secretary.

EDGAR A. IGLEHEART has been elected president of Igleheart Bros., Inc., Evansville, Ind., succeeding the late John L. Igleheart. The new president was formerly vice-president and general manager.

DR. JOHANN R. KATZ, of University of Amsterdam, Holland, world authority

JAMES F. BROWNLEE
Elected President of Frosted Foods

HENRY G. BURKE
Made Secretary of Pretzel Group

C. H. HOWELL
Will Direct Kraft in Canada

CECIL F. ORTMAN
Succeeds Oldest Head Miller

on the staling of bread, has spent several weeks in the United States and has addressed numerous cereal chemist groups.

A. C. KING, for the past five years executive vice-president of Citrus Products Co., Chicago, is now president of the company. He succeeds Eric Scudder, resigned.

A. ROBERT LILLY, manager of the Manchester (N. H.) office of Swift & Co. for the past 28 years, has retired after 41 years in the employ of the firm. Leo Pratte, Biddeford, Me., succeeds him.

CECIL F. ORTMAN succeeds his father, the late Barnim F. Ortman, the country's oldest head miller, as head miller of George Urban Milling Co., Buffalo. Mr. Ortman has been with the company for 33 years.

JUNIOR OWENS, national secretary of American Bottlers of Carbonated Beverages, has returned to his job after having taken a trip to Europe on physician's orders.

CHARLES H. NEWMAN, formerly president of Tex-O-Kan Flour Mill Co., Dallas, recently was appointed manager of Wichita Mill & Elevator Co., Wichita Falls.

W. H. STROWD, secretary of Southeastern Millers' Association, has resigned to organize National Association of Independent Mills.

T. R. WARREN and C. O. ADAIR, chemist and miller, respectively, with Bob White Flour Mills, Kingfisher, Okla., have leased Vici Flour Milling Co., Vici, Okla., and will operate the 50-bbl. mill under the name of Vici Roller Mills.

CHARLES H. SCHWEGMAN has been elected president of Parkway Brewing, Inc., Cincinnati. Other officers are GEORGE SICKLES, D. C. CORBIN and ARNOLD S. MANN, vice-presidents, and HARRY H. SHAFER, secretary-treasurer.

DEATHS

H. B. BABBITT, secretary-treasurer of Lincoln Canning Co., Merrill, Wis., a member of the canning industry for 48 years, died Oct. 8 at the age of 77.

JOHN W. DUNN, 61-year-old head of Alexandria (La.) Coffee Co., was found dead recently in his office.

DAVID HUCK, for the past ten years factory superintendent for the Brooklyn (N. Y.) plant of Fanny Farmer Candy Shops, Inc., died recently, aged 61.

JOHN L. IGLEHEART, 70, president of Igleheart Bros., Inc., Evansville, Ind., subsidiary of General Foods, Inc., died recently. He had been with the milling company, which was established by his father and two uncles, practically his entire life. A son, Austin, is vice-president in charge of production for General Foods.

THOMAS C. MCCAHAN, a retired sugar refiner and son of the founder of W. J. McCahan Sugar Refining Co., Philadelphia, died Oct. 17, aged 73.

O. W. MOSHER, 80-year-old president of New Richmond (Wis.) Roller Mills Co., died Oct. 5 after an extended illness. He had been in the milling and grain business for 50 years.

WILLIAM S. PENICK, co-founder and chairman of the board of directors of Penick & Ford, Ltd., Inc., died in New Orleans, Oct. 13. He was 63.

CHARLES H. H. ROST, 44, president and general manager of Canton (Ohio) Bread Co., died recently.

ADAM SCHEIDT, founder and president of Adam Scheidt Brewing Co., died at his home in Norristown, Pa., Oct. 17, at the age of 79.

SIDNEY W. SINSHEIMER, president of American Beet Sugar Co., Denver, died Oct. 4, of heart attack. He was 58. Mr. Sinsheimer organized Holly Sugar Corp. in 1905.

OTTO SCHENK, 71, president of Columbus Packing Co., died Oct. 3. Mr. Schenk operated a large packing plant in Wheeling for several years.

CHRISTIAN UFFELMANN, vice-president and secretary of Uffelmann Baking Co., Cincinnati, died Oct. 2. He was 43.

EDWARD O. WUNDERLICH, treasurer of Nestlé Milk Products, Inc., died in New York on Oct. 20. He was 47.

Associated Industries

AMERICAN ROLLING MILL CO., Middletown, Ohio, will manufacture and distribute stainless steel.

CHICAGO TRIBUNE will conduct a cooking school at which advertisers' products will be demonstrated.

C. B. GRAY, who formerly sold Sprague-Sells equipment in the Tri-States, has been succeeded by H. C. Randall, of the New York office. Mr. Gray is now president of the Harford County Canning Co.

L. L. LAUVRE succeeds the late E. B. Kramer as manager of the screw cap department of Crown Cork & Seal Co.

LEVER BROS. are planning consumer distribution of "Covo," a vegetable-oil shortening.

NATIONAL ASSOCIATION OF ICE INDUSTRIES has received approval of its code of fair competition; minimum wage is 32½ cents per hour in the North and 23 cents in the South.

CHARLES PIEZ, chairman of the board of Link-Belt Co., Chicago, died Oct. 2.

STEVENSON-MAIRS Co. has been formed as sales agent for canned foods in Maryland, Delaware, Virginia and Pennsylvania, with offices at 200 East Lombard St., Baltimore.

GLASS CONTAINER ASSOCIATION OF AMERICA has received approval of its code of fair competition; minimum wage is 40 cents.

BUSINESS TRENDS

Small Canning Crops Forecast; Coast Cherry Pack Soars

As a result of drought, heat and storms in cultivated areas, crops of beets, cabbage (for kraut), green lima beans, pimentos and tomatoes will be from 15 to nearly 50 per cent smaller this year than in 1932. This forecast is derived from reports recently issued by the U. S. Bureau of Agricultural Economics.

The beet crop is predicted to be 20 per cent, or 4,000 tons, smaller than in 1932, while the cabbage crop is expected to be the smallest since 1921, and about half that of 1932. It is also indicated that both the lima bean and tomato crops will be 20 per cent smaller than last year's. With the exception of 1931, the likely yield of tomatoes per acre on the total acreage will be the lowest for the past 15 years. About 9,210 tons is the expected crop of pimentos, or approximately 56 per cent of last year's crop.

Totals of the cherry pack on the Pacific coast indicate an increase over last year's pack of nearly 90 per cent, according to figures of the Canners' League of California.

BASIS FOR THE CURVES

Retail food prices, factory employment, factory payrolls and wholesale prices are based on indexes of the Department of Labor. Cost-of-living index is that of the National Industrial Conference Board. Electrical power consumption figures are furnished by *Electrical World*.

Prices Irregular

Sharp declines in manufactured foods in the commodity markets during October were somewhat offset in the latter part of the month by a brisk rally in wheat, occasioned by government buying. Other commodities were generally irregular.

Labor disputes and consumer reaction to higher prices, coupled with curtailment of steel production, accounted for further retarding of business activity.

The Business Week Index of business activity (preliminary figure) stands at 61.3 per cent of normal for the week ending Oct. 14, closely approximating the low level since July 15 reached during the week ending Sept. 16.

Wholesale prices reported by U. S. Department of Labor showed a slight weakening during the week ending Oct. 14 and a recession of 0.5 per cent from the level of the week ending Sept. 16. Farm products rose 0.8 per cent, while manufactured foods declined 0.3 per cent during the weeks ending Sept. 16 to Oct. 14.

All commodities during the month ending Oct. 21 dropped 2.1 per cent in the weighted price index of the New York *Journal of Commerce;* grain dropped 6.5 per cent and food 7.6 per cent.

A. & P. tonnage sales ending Sept. 30 were 8.7 per cent less than in the same period last year, and 22 per cent less than for the five-week period ending Sept. 2, last.

Export and Import Values Up

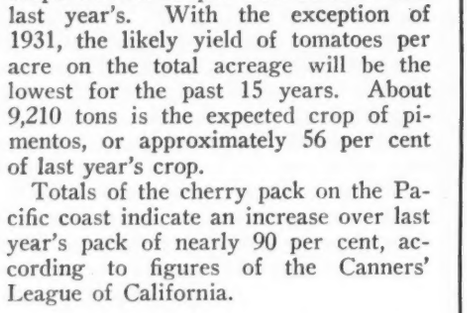
Although exports during the first six months of this year were valued at 20 per cent less than in the same period last year, 22 per cent of the chief exports, all manufactured items, were larger on a value basis than they were a year ago. These include lard and cured hams and shoulders with 5 and 19 per cent increases, respectively. Wheat was 91 per cent below, barley 126 and corn 16 per cent above 1932.

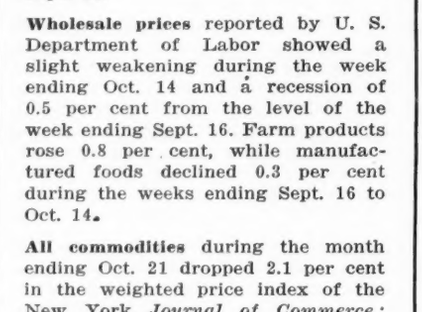
Imports increased during the second quarter of this year. Among the commodities imported in larger quantities than in 1932 are copra; coconut, palm, and olive oil; spices; tea; cheese; meats; and fish. Coffee remained the leading export, while cane sugar displaced raw silk in second place. Both cocoa beans and cane sugar were within one per cent of their value in 1932. Of the latter, more than half the quantity imported was from the Philippines.

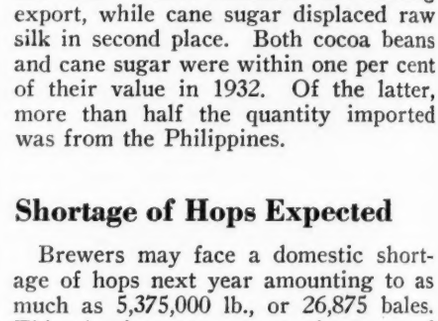
Shortage of Hops Expected

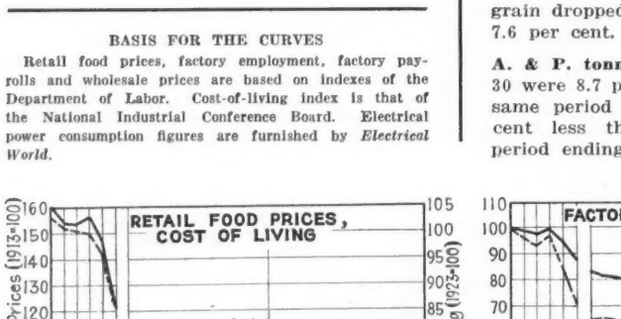
Brewers may face a domestic shortage of hops next year amounting to as much as 5,375,000 lb., or 26,875 bales. This despite an apparent increase of some 20 per cent in production of hops this year.

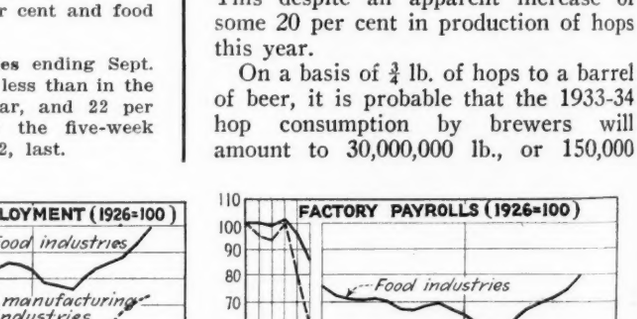
On a basis of ¾ lb. of hops to a barrel of beer, it is probable that the 1933-34 hop consumption by brewers will amount to 30,000,000 lb., or 150,000











bales. The demand of the homebrew makers for malt syrup has not declined following legalization of beer, as was anticipated, so that some 10,000,000 lb. of hops will be needed for that market. Furthermore, repeal of the liquor law is expected to create a demand for more hops in the manufacture of such beverages as ale and stout. Taking everything together, a conservative figure for the 1933-34 hop requirements is 40,000,000 lb., and if the demand equals that of the 1910-14 period, consumption will amount to 42,375,000 lb., or 211,875 bales. Against this there is a domestic supply of some 175,000 or 185,000 bales.

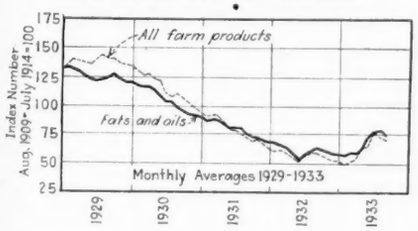
Forecasts Food Freight

Reflecting damage done in Texas by the hurricane, the freight car requirements for citrus fruit in the Southwest will be 85 per cent lower in the third quarter of this year than in the same period of 1932. This is according to the forecast by American Railway Association. For all territories, however, freight car requirements for citrus fruit show an increase of 13.3 per cent.

Increases for other food commodities are as follows: flour, meal and other mill products, 4.5 per cent; potatoes, 2.1; poultry and dairy products, 6.2; salt, 4.9; sugar, syrup and molasses, 11.7; canned foods, 11.8. Some foodstuffs show decreases, as follows: grain, all, 8.8 per cent; fresh fruits, other than citrus, 7.0; fresh vegetables other than potatoes, 12.1; livestock, 4.3.

Car requirements in certain sections will be quite different from the average for some commodities. In the Atlantic states, there is an estimated increase of 20.0 per cent for sugar, syrup and molasses; in the Pacific coast and Pacific Northwest territories, the estimate for grain is an increase of 31.3 and 53.4 per cent, respectively. There will be a 360.7 per cent increase for potatoes in the Ohio Valley, and 49.1 and 42.9 per cent decreases, respectively, in the Midwest and Missouri-Kansas regions.

Price Index for Fats and Oils



Cost of Food Keeps Pace With Factory Pay

Food costs, as represented by typical monthly purchases per family, kept pace with changes in average monthly wages of factory workers from February to August, Dr. Fred C. Howe, Consumers' Counsel of A.A.A., reported on Oct. 13. In February, the average monthly pay of factory workers amounted to $68, the retail cost of the family's typical food purchases being 22 per cent of that amount. In August, average pay had risen to $79, and the food cost still represented 22 per cent of the pay of the consumer.

By paying an additional 20 per cent for the food that goes into the family market basket, consumers have made possible a 50 per cent increase in payments to farmers, as compared with prices on Feb. 15, Dr. Howe has announced.

On Sept. 12, prices were above their Aug. 29 level, the cost of the typical monthly food purchase rising from $17.74 to $17.82. Prices to the farmer for these foods, on the other hand, dropped from $6.87 to $6.61. This means an increase in the processor's and distributor's margins from $10.87 to $11.21.

The following table shows the changes in retail prices of representative foods in the United States from Feb. 15 to Sept. 12:

Commodity	Feb. 15 Cents	Sept. 12 Cents	Per Cent change
Butter (lb)	24.8	27.9	12.5
Cheese (lb.)	21.3	23.5	10.3
Milk (qt.)	10.3	11.0	6.8
Eggs (doz.)	21.4	28.3	32.2
Hens (lb.)	21.3	20.4	—4.2
Round steak (lb.)	24.2	26.2	8.3
Leg of lamb (lb.)	21.7	22.3	2.8
Flour (lb.)	2.9	4.9	69.0
Bread (lb.)	6.4	7.7	20.3
Lard (lb.)	7.7	9.8	27.3
Potatoes (lb.)	1.5	3.0	100.0
Macaroni (lb.)	14.6	15.5	6.2
Rice (lb.)	5.8	6.6	13.8
Prunes (lb.)	8.9	10.1	13.5
Pork chops (lb.)	17.6	21.7	23.3

CONSTRUCTION NEWS

	Pending (thousands)	Awarded October	Total 1933 (thousands)
Bakery Products	$68	$137	$585
Beverages	15,105	5,071	22,458
Canning and Preserving	474	48	389
Confectionery	.....	.....	.....
Grain Mill Products	340	1,780	3,049
Ice, Manufactured	.....	.....	559
Meats and Meat Products	156	75	516
Milk Products	522	132	1,231
Sugar	.....	.....	.....
Miscellaneous	28	94	1,074
Total	$16,693	$7,337	$29,861

INDICATORS

PORK PRICES reached the highest point since July, 1932, and equaled that figure on Oct. 9 when packers paid up to $5.55; a subsequent liberal supply brought the market downward.

THE CUCUMBER CROP is estimated at 3,000,000 bu., against the normal pack of 6,000,000 bu. What with a 30-per cent increase in sales in the first eight months of this year there may be a shortage.

ICE CREAM and milk sales are adversely affected by beer, according to C. H. Haskell, president, Beatrice Creamery Co., Chicago.

COFFEE is consumed in larger quantities than before legalization of beer, the New York Coffee & Sugar Exchange reports. September deliveries totaled 1,029,000 bags, against 883,000 bags last year.

THE RATIO OF PRICES received by farmers to prices paid by them increased from 50 on March 15 to 61 on Oct. 4.

THERE IS NOW 175,000,000 lb. of butter in cold storage, double the volume of a year ago, American Creamery Butter Manufacturers' Association estimates.

TWO SMALL FLOUR MILLS have been opened in Alabama, one at Crossville and one at Jacksonville. These will grind flour for home usage. Alabama may grow more wheat this fall than ever before.

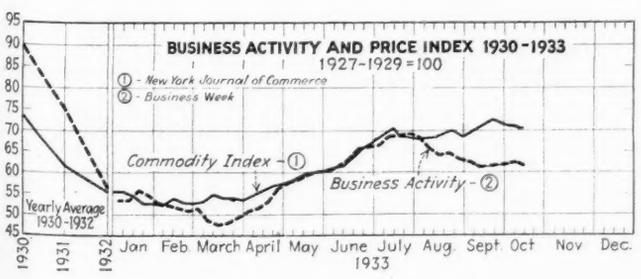
IN DALLAS and some other Texas cities, grocers are building up a "buy local" attitude through newspaper advertising.

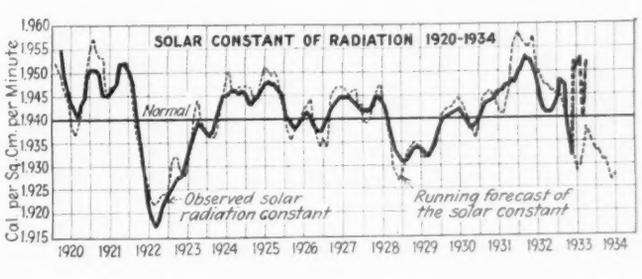
THE SUGAR BEET yield in the United States this year is placed at 10,887,000 tons, compared with 9,070,000 tons in 1932.

SALES OF DAIRY EQUIPMENT reflected substantial improvement in July, August and September, exceeding the corresponding 1932 period, Cherry-Burrell Corp. reports.

GERMAN LARD IMPORTS from now to the end of 1933 are estimated at between 40 to 60 per cent of last year's imports for the same time. A duty equivalent to more than 15 cents per pound now prevails.

INDIA'S SUGAR INDUSTRY, fostered by a high tariff, has expanded until it can now supply needs of the domestic market.

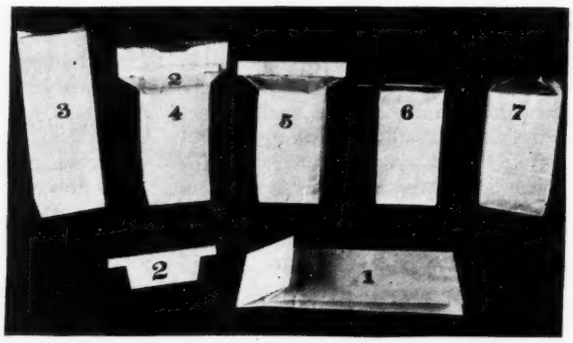




NEW • EQUIPMENT • FOR

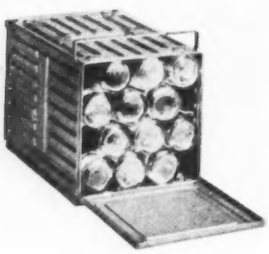
Truck Has 15-Ft. Lift

Upper areas of warehouse space are not wasted with the new telescoping truck made by Elwell-Parker Electric Co., Cleveland, Ohio. This truck will transport material from place to place and will lift it to heights of 15 ft. for stacking, handling cases weighing as much as 400 lb. An electric storage battery supplies power. In storing material, the operator rides up with the load, controlling the lift by pushbuttons. When the uprights are collapsed, the truck will move through ordinary doorways.



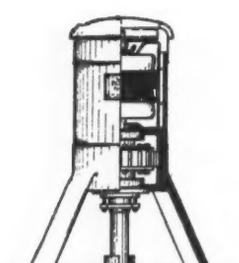
Steel Beer Case

So compact is the steel beer-bottle container developed by Pines Winterfront Co., 1135 North Cicero Ave., Chicago, Ill., that it can be stored in one-third less space than other returnable beer cases, according to the manufacturer. Enameled to make it rustproof, the metal case is constructed with two compartments, each of which will hold twelve bottles. Hinged doors open out at each end and the bottles are inserted neck first. Then the doors are closed and fastened in place with a latch. A handle on the top of the cases permits one man to carry two at a time. The Pines beer-bottle container measures 15¾x10x10¼ in. It is made of 22-gage sheet steel and is reputed to have long life. It can be handled on any type of conveyor.



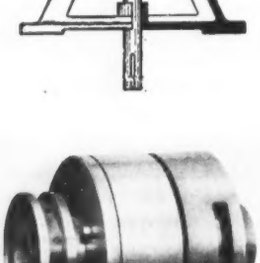
Agitator Drive

Built upon a new principle, the Unipower self-contained agitator drive manufactured by Patterson Foundry & Machine Co., East Liverpool, Ohio, consists fundamentally of an inbuilt motor and a new type of speed reducer unit inclosed in a one-piece housing. The motor is designed to withstand 400-per cent momentary overload. It is covered with a close-fitting metal cap protecting it from dust or drippage. Speed reduction is not by gears but by a new plunger and rack device. Using an 1,800-r.p.m. motor, the reducer will give a shaft speed of less than one revolution per minute, if desired. The agitator drive is built with ball bearings and is provided with Alemite fittings for lubrication. All working parts are completely inclosed and operate in oil. These units are available in sizes up to 40 hp. A horizontal type agitator drive employing gears also is available.



Oil-Burning Oven

Operating costs are held to be reduced as much as 50 per cent, compared with gas and other equipment, by the oil-burning bake oven built by Motor Wheel Corp., heater division, Lansing, Mich. The oven is a four-tray unit with a capacity of forty-eight 1½-lb. loaves of bread or twenty-four 10-in. pies, or their equivalent. Deep pan roasting is permitted by removable doors and trays. A clean, intense heat without odor, ashes, smoke or room gases is provided in the oven, the manufacturer states. A further advantage attributed to the unit is that drying out of foods and loss of flavor is avoided and shrinkage reduced from 10 to 20 per cent as a result of the oven's being unvented. The oven is insulated with 2-in. tumbled Rock Wool.



Magnetic Clutch

What is said to be the first magnetic clutch suitable for operating in oil, water or other liquids is announced by Magnetic Manufacturing Co., Milwaukee, Wis. The clutch which also will operate dry, is a small multiple disk unit, 6 in. in diameter and larger. Though small, the clutch has a high torque capacity and ample friction area, the manufacturer states. A simple one-point adjustment compensates for lining wear to provide for long service.

Machines Turn Out Flat-Top Bags

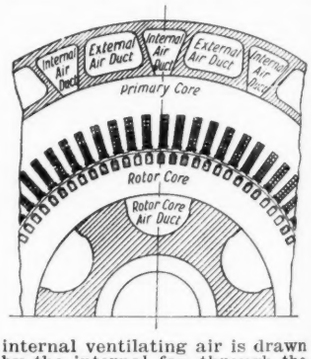
Coffee bags that have a flat top when closed and that may be reclosed after opening can be made, filled and sealed with machines marketed by Wright-Dalton Machinery Co., Inc., 781 Ocean Ave., Brooklyn, N. Y. These bags are closed in such a way that the top folds over flat, as shown in the illustration. If desired, a tin section can be folded in with the paper to act as a tying device. The company supplies four different machines. One will make the bag and fill, close and seal it. Another is a filling and closing unit. A third will close and seal the bags. The fourth is an automatic magazine that feeds the tin ties. The speed of the units varies from 50 to 60 per minute, two attendants being required. Standard American coffee bags can be used with the machines. One advantage of the tin tie is that it permits the packer to adjust the closure to variations in bulk. Without the tin tie, the bags can be used for a number of free-flowing commodities, such as rice, beans, sugar and tapioca.

CO_2 Regenerating System

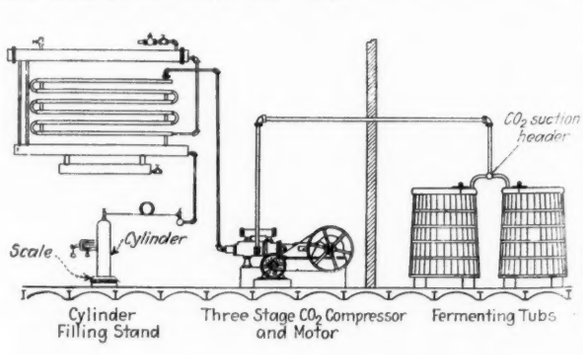
CO_2 is reclaimed from fermenters in breweries, liquefied, stored, and then released through a pressure reducing valve for carbonating beer. This is the operating cycle of the CO_2 regenerating plant announced by Carbondale Automatic Machine Co., Carbondale, Pa. The unit consists of a suction header, which takes the CO_2 directly from the fermenting tubs, a three-stage CO_2 compressor and motor, a condenser and a cylinder filling stand. The system reclaims the CO_2 directly from either open or closed fermenters, and it automatically adjusts itself to the quantity of gas produced at the tubs. The system also automatically rids itself of the excess air and water that may be carried over with the gas. An advantage attributed to the liquefying system is that a large quantity of CO_2 can be stored in a small place.

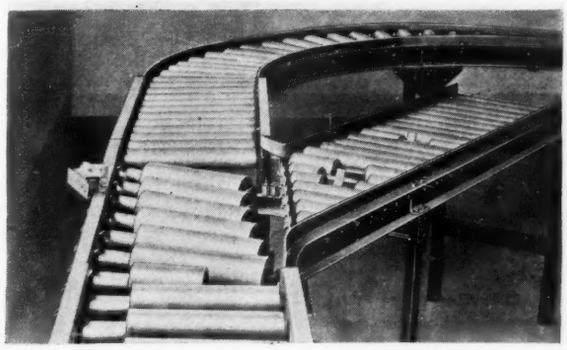
Inclosed Motors With Dual Cooling

Totally inclosed motors with mounting dimensions comparable to open types are now available. Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa., has perfected a scheme of ventilation which makes this possible on motors up to 200 hp. The frame of this type of motor contains two sets of ducts. The first extends from one end of the frame to the other, inside the motor. The



internal ventilating air is drawn by the internal fan through the air gap and rotor core vent holes, and is driven through the stator and windings and through the internal ducts over the stator core. The internal air is sealed within the motor when the machine is assembled. A second set of ducts alternates with the first and passes from each end to the center of the motor. Since the ducts carry external air in close proximity to the internal air, there is a heat-exchanger effect. These machines are designed especially for hazardous locations or where there is excessive dampness.





Power-Driven "Gravity" Conveyor

Roll conveyors that operate independent of gravity are now available. Lamson Co. Inc., Syracuse, N. Y., has put on the market a "live-roll" conveyor. The rolls are driven by a multiple-strand rubber-covered steel cable held against the rolls by idlers; the rolls will stop under load without damage. The live-roll conveyor maintains a convenient working level all along the conveyor line. A unique deflecting device switches cases to a branch conveyor. When the switch is closed, the rolls set at an angle, as shown in the illustration. When the switch is open the rolls are straight and the packages travel straight down the conveyor. The units are built in horizontal, inclined, declined or spiral types.

Fumigant Effective Without Vacuum

Eggs, larvae and insects among cereal or vegetable products may be destroyed without the use of vacuum tanks. This is the claim made by Liquid Carbonic Corp., 3100 South Kedzie Ave., Chicago, Ill., for Proxate, its new fumigant. Sealed rooms or bins are suitable for fumigating with this gas. However, Proxate can be used successfully in vacuum tanks where that type of equipment is installed. The gas, although more toxic than carbon bisulphide, is nonpoisonous and can be breathed without ill effects; it is harmless to food. The gas is not inflammable and, in emergencies, can even be used to extinguish fire. It is delivered in steel cylinders having a capacity of 450 cu.ft., and it may be stored indefinitely.

The Manufacturers ••Offer••

Recording Thermometers—Instruments and accessories. Foxboro Co., Foxboro, Mass. Bulletin No. 169-1; 47 pp.; illustrated.

Malt Milling—Handling, cleaning and crushing processes. Allis-Chalmers Manufacturing Co., Milwaukee, Wis. Bulletin 1250-A; 19 pp.; illustrated.

Photoelectric Relays — Various types to meet different conditions. General Electric Co., Schenectady, N. Y. Booklet GEA-1654A; 16 pp.; illustrated.

Regulators—Flow, level and pressure controls. Northern Equipment Co., 1945 Grove Drive, Erie, Pa. Booklet; 16 pp.; illustrated.

Conveyor — The "Airveyor," for unloading bulk materials pneumatically. Fuller Co., Catasaqua, Pa. Bulletin A2; 8 pp.; illustrated.

Sifter—Ro-Ball stabilized gyrating screen. J. H. Day Co., Cincinnati, Ohio. Bulletin 360; folder.

Tubes—Uniflex internal tube equipment. Cherry - Burrell Corp., 427 West Randolph St., Chicago, Ill. Bulletin No. G-215; 20 pp.; illustrated.

Refrigerating Units — Low-pressure refrigeration and air-conditioning equipment. Frick Co., Inc., Waynesboro, Pa. Bulletin No. 97-A; 12 pp.; very well illustrated.

Motors—The Motorizer, Vol. 1, No. 12. Practical questions and answers concerning a.c. induction motors. Lincoln Electric Co., P.O. Box 683, Cleveland, Ohio. 8 pp.; line drawings.

Brewery Equipment — Glass-lined steel tanks and fittings. Pfaudler Co., Rochester, N. Y. Catalog 751; 34 pp.; very well illustrated.

Compressors — Feather valve equipped, for refrigeration. Worthington Pump & Machinery Corp., Harrison, N. J. Bulletin L-600-B2; 15 pp.; installation views.

Chains and Sprockets—Tabulated descriptions of various types. Diamond Chain & Manufacturing Co., Indianapolis, Ind. Catalog No. 583; 96 pp.; illustrated; cloth binding.

Aluminum Paint—Its uses, utility and application. Aluminum Co. of America, Pittsburgh, Pa. Booklet; 45 pp.; well illustrated.

Steel Clad—Ingoclad: mild carbon steel clad with stainless. Ingersoll Steel & Disc Co., 310 South Michigan Ave., Chicago, Ill. Folder; illustrated.

Filtration Equipment — The Sweetland filter and its use in the brewery. Oliver United Filters, Inc., 33 West 42d St., New York, N. Y. Booklet; 10 pp.

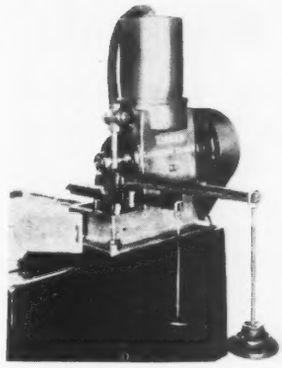
Beer Barrel—The "New Way" barrel story. A. O. Smith Corp., Milwaukee, Wis. Bulletin No. 514; 22 pp.; well illustrated.

Filling Equipment—Tube, jar and powder filling machinery. F. J. Stokes Machine Co., Tabor Road, Philadelphia, Pa. Booklet; 33 pp.; liberally illustrated.

Reels — Continuous contact reels. J. L. Gleason & Co., 207 Bent St., Cambridge, Mass. Folder; 9 pp.

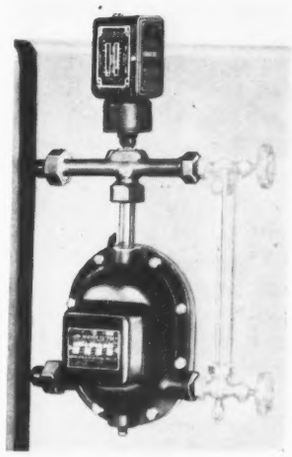
Lubricant Tester

Lubricants may be tested for film strength, friction and abrasiveness with a machine developed by Timken Roller Bearing Co., Canton, Ohio. Essentially, the machine comprises a cast-iron base supporting a testing mandrel, a tank containing the lubricant and a lever system for applying load or friction. The lever includes a friction arm, a Vernier scale, and a sliding weight. An electrical heating unit keeps the lubricant at any desired temperature from ambient up to 210 deg. F. No special training is needed to operate the tester.



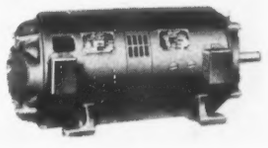
Feed-Water Control

Boilers are safeguarded against being fired dry by a low-cost control unit announced by Minneapolis - Honeywell Regulator Co., Minneapolis, Minn. Designed for gage-glass mounting, the control is simple and inexpensive. It consists of a low-water cutoff, a solenoid operated water feed valve and a duplex switch. With the low-water cutoff connected in the power circuit, the boiler is automatically shut down when the water becomes low. With the water feed valve, the unit refills the boiler automatically; the feeder valve connections can be employed to operate an alarm if desired. To provide a high-limit control, a vapor pressure control or vacuum control is screwed into the built-in siphon on the top of the low-water cutoff, making it a duplex switch. The water feeder valve may also be used with the duplex switch.



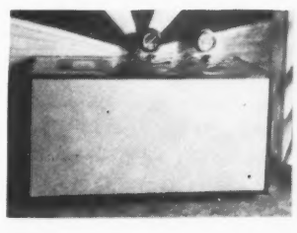
Dual Motors

Dual motors that operate on either a.c. central-station power or the d.c. output of generators on railway cars or trucks are announced by Century Electric Co., St. Louis, Mo. The dual motors consist of two separate motors in one two-bearing housing, with the two rotors on a common shaft. The dual construction allows each motor to be designed for the best operating characteristics and makes for compactness. The motors are built in ¼-, ¾-, 1 and 1½-hp. sizes.



Two Temperatures In One Cabinet

Two widely differing temperatures are maintained in the ice cream cabinet marketed by Driice Appliances, Inc., 420 Lexington Ave., New York, N. Y. Moreover, the temperatures may be varied to any degree desired. A four-hole cabinet recently put on exhibition registered a low temperature of — 38 deg. F. at two holes and a high temperature of + 11 deg. F. in the other two holes, holding these temperatures steadily. This cabinet employs solid CO_2 as a primary refrigerant, and heat transfer is effected through a liquid secondary refrigerant which is not evaporated. The principle employed for obtaining controlled refrigeration of this type reverses the conventional practice where heat transfer is obtained through convection currents set up in the secondary refrigerant, and it takes advantage of "telekinetic" action at the point of heat transfer, the manufacturers state. The entire system is sealed and requires no servicing. Temperature control is obtained without the use of valves, thermostats or any other mechanical means. This principle of refrigeration can be applied to trucks, railroad cars and other uses. The Driice equipment is manufactured by J. P. Devine Mfg. Co., and Mount Vernon Car Mfg. Co.



Aluminum Barrel

Beer barrels of solid cast aluminum are announced by National Bronze & Aluminum Foundry Co., Cleveland, Ohio. The cast aluminum has a high thermal efficiency, retaining low temperatures, and it has the additional advantages of being without welds, seams and paint, the manufacturer maintains. A plastic pitch impregnates the aluminum, eliminating the necessity of repitching. The barrels weigh 70 lb. and are of truss construction to give high strength.

Flour Milling Is Not Merely Grinding But Selective Grinding

(Concluded from page 452)

streams may be combined to make a clear. If the patent and clear are blended together, we obtain the product known as a straight grade flour.

On the left of Fig. 1 the dotted line leads us to the total feed obtained and its subsequent classification. The low grade is shown with the feeds. With hard winter and soft wheat, it is often classified with the flours (depending on its quality). Should low grade be placed in the flour, the second row on the right of Fig. 1 (see double line leading to flour) would then approximately read, "patent, 80 per cent clear, 17 per cent; low grade, 3 per cent." These latter three are then combined to form the straight grade flour. After the streams are blended, they may be bleached, if desired. Bleaching is *Step 7,* or the last, in modern milling.

The percentages specified for the patents, clears, and low grade vary a great deal. In Table II, "Milled Products and Their Uses," under soft wheat, we see that these streams are blended in different proportions to obtain flours of the desired characteristics.

Our present-day milling system produces two distinct lines of products: flour (or semolina) and feed. Feeds are the byproducts. "In the very earliest days of bread regulations, the bakers were not permitted to sell at retail from their shops, but as a sort of compensation they were the only community group that were permitted to keep swine in their houses. This was for the purpose of promoting the speedy consumption of bran and other bakery wastes, also to relieve the baker from any temptation to make his bread too coarse." Thus the byproduct was disposed of, but today feeds require a separate sales unit.

Bread flours (spring and winter wheat) with increasing protein usually give larger volumes in baked products and are termed stronger flours. Consequently, such flours are milled to definite protein standards. Another recent advancement is the production of flours of uniform enzymatic activity.

The soft-wheat flours, as their name implies, must not exhibit strength, and consequently are milled to low protein standards—approximately 7.5 to 8.0 per cent on the patent flours.

Semolina—durum—is milled to a color standard of a bright yellow. Color is of prime importance.

Table II, "Milled Products and Their Uses," contains a condensed summary of the general uses by consumers. As in all such general tabulations, modifications are to be expected in specific requirements.

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Bailey, C. H.: "The Chemistry of Wheat Flour."

WHAT'S ON YOUR MIND?

Sugar vs. Cement

To the Editor of FOOD INDUSTRIES:

Since I have spent the better part of a decade in the sugar business, both as chemist and technologist, Mr. Thomas S. Jones' letter appearing on the contents page of July, 1933, FOOD INDUSTRIES takes my interest. Even as cement is a complex chemical product so is sugar, "in the raw," a complex mixture of chemical entities if not a complex chemical itself. Much technical and scientific skill is required and utilized in the production of high-grade refined sugar, this technological guidance beginning with the planting of the cane or beet, and continuing through until the final product of nearly 100 per cent pure sucrose is obtained. This technical control is concerned not only with the proper treatment of the "sugar base" (the sugar cane or the sugar beet) in all of the various processes through which it must pass but also with the adjunctive materials of chemical nature which are necessary in the processing such as: water, lime, phosphoric acid, sulphur and many others which may or may not be directly used in the processing.

It is seen that "sugar" is in general "scientifically processed" and even as in the case of cement, as stated by Mr. Jones: "— their quality is responsible for the success or failure." This does not, however, relieve the purchaser of the responsibility of carefully testing a given lot of sugar, especially where the use of that sugar requires a critical conformance with a predetermined standard of quality, particularly evaluated and established for a prescribed use. In the foregoing, I have had in mind, among other uses, the use of granulated commercial sucrose in the manufacture of hard candies. A. B. KENNEDY.

Texas City, Texas.

Peanut Germs

To the Editor of FOOD INDUSTRIES:

We note in your July issue of FOOD INDUSTRIES, in the "As It Looks To Us" department, that one of your subscribers wants to know what to do with peanut germs which are a byproduct from the manufacture of peanut butter.

Permit us to suggest that this subscriber use this or sell it as a feed for chickens. We have large amounts of this same product to dispose of and the writer has found that it makes an excellent feed, by mixing it with small grain or laying mash. Chickens like it mighty well and it contains a high food value, there being no refuse or chaff of any kind in it. We know of one peanut-butter manufacturer who mixes this with grain and does quite a good business on it.

He could possibly make arrangements with some store handling poultry feed to use his entire output at a much better price than he is now getting. I would suggest that he mix this with small or chopped grain, using about one-third grain by volume. I have found that this makes an excellent feed and will produce eggs. CHAS. JOHNSTON

Brundidge, Ala.

More About Peanut Germs

To the Editor of FOOD INDUSTRIES:

We notice in the July number of FOOD INDUSTRIES, on page 242, that you are requesting some information on the utilization of peanut germs accumulated during the manufacture of peanut butter. Recently one of our customers wrote us on this subject and we made some inquiries in Chicago. We found that one use for this material was in the manufacture of certain chicken feeds. We were given the name of Darling & Co., 4201 South Ashland Ave., Chicago, as purchasers of this product. W. H. H.

Chicago, Ill.